


# THE POLAR TIMES



Spring-Summer 2004



COURTESY OF PETER SCOTT

*Kong Oskar Fjord looking north west. Kong Oskar Fjord is the southern entrance to an intricate fjord system stretching hundreds of miles inland.*

# The Polar Times

American Polar Society  
Spring-Summer 2004  
Vol. 3, No. 5

## American Polar Society

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$15 a year (\$17, foreign) and entitle members to receive *The Polar Times* twice a year. The American Polar Society is classified as a tax exempt organization under Sec 501(C)3 of the IRS Code. For more information about the American Polar Society, contact **Capt. FRANK STOKES, APS Secretary**, at 1.850.497.0759 or send email to [sto346@yahoo.com](mailto:sto346@yahoo.com).

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## The Polar Times

Spring-Summer, Vol. 3, No. 5

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### ABOUT OUR FRONT COVER

*Attestupan, the world's highest seacliff stands along the inner reaches of Kujser Franz Josephs Fjord.*—PHOTO COURTESY OF PETER SKAFTE

## The President's Letter

I suppose the Society president should have some kind of an agenda, so I have considered a few issues that I have been thinking about and working on (mainly, thinking) since our symposium at the Byrd Polar Research Center in October 2003. Some of these issues involve only a few of the members and, in other respects, all of us.

Before I tick them off, I would like to say with great pleasure that the Society has a new Membership Chair to take up the reins of outgoing **Bob Kremenak**. His name is **Charles Lagerbom**. He lives in Belfast, Maine, and has introduced himself elsewhere in this issue of *The Polar Times*. He has been a Society member since the 1990s, has Antarctic field work in his resume as a result of working with a team from the University of Maine-Orono, in the Dry Valleys of Antarctica, 1990-91 and 1992-93, and after receiving his MA Degree in History at Orono, began teaching archaeology and history in the Belfast Area High School. If you really know your Antarctic book literature, you will be aware that he is the author of a book on Birdie Bowers (*The Fifth Man: The Life of H.R. Bowers*, 1999, Caedmon & Whitby) and is also quite a collector, with some 950 polar titles in his collection, mostly on Antarctica. Charles is assuming his new role this Spring, during a transition period while Bob Kremenak transfers his files and prepares himself for a new life without sending dues announcements and the like. To top it off, Charles has agreed to another job as a volunteer for the Society, that of providing indexes to the issues and volumes of *The Polar Times*.

What about Bob? It is not a matter of simply saying "Thanks, Bob." His dedication and hard work toward the job has been outstanding. It is essentially a daily task, working with the Society Treasurer to attract new members and maintain the membership list. Bob is not really leaving us, for he is on the Society's Board of Governors and will continue to serve us in other ways.

Now that I have your attention about Charles, Bob, and membership, I will bring up another agenda item, that of membership categories and a healthy Society budget. One of the common themes in my letter in each issue will continue to be to recruit new members, search for corporate and private contributors in order to maintain a budget that can support Society Symposia and also to branch out into new areas of interest that will benefit members and the polar world in general. Support can work in two ways—that of contributions from within and outside the Society and also Society support for worthy projects such as education, research, student assistance, and so forth, each of which can relate to the Symposium sponsored by APS.

As a start, Society members might consider taking a new approach in response to your next dues notice. Rather than begrudging this as an annual event, give our new Membership Chair a break and make it a multiple-year dues payment; or, depending on the news from your doctor and actuarial life insurance tables, try a life membership at \$250 for U.S. members or \$270

outside the United States. Think of all the postage you can save!!

If you have been counting agenda items, that makes two. The third has to do with re-examining the Society Constitution and Bylaws. Through time, organizations like ours change and require updates of the ways in which they operate. Because it has worked well for so long, I do not see anything that is in obvious need of change, except perhaps formalizing the Membership position to a "Chair" and including the immediate Past President in meetings of the Board of Governors as a means of continuity of leadership and transition for the incoming President. Those are little things, but probably should be formalized in the Constitution.

Speaking of contributions, elsewhere in this issue you will find an article on the organization known as Oceanites and its site inventory of wildlife in the Antarctic Peninsula. It, like the Wilderness Research Foundation, is one example of the type of activity that Society members might consider supporting; many others exist for legitimate polar activities.

Agenda item 4 pertains to a Society symposium. My recommendation is to build on the success of our latest one on "The Role of Women in Polar Regions" and think of scheduling the next one for 2005 or even 2006. Several options have already been voiced by members, ranging from University of Alaska-Fairbanks, in combination with another event; Bowdoin College, Brunswick, Maine, also in combination with an anniversary event commemorating Admiral Peary; Keene, New Hampshire (local college, proximity to Dartmouth College, CRREL, and so on); and a few "also-rans." I invite your suggestions on this topic.

As I mentioned in my previous letter, for anyone interested, Society Secretary Frank Stokes has also mentioned stepping down and vacating his position. Contact Frank if you would like to be more involved in what we do (see *The Polar Times* masthead for his telephone and email information).

And a final topic: Congratulations to Dr. Ellen Mosley-Thompson, Byrd Polar Research Center, elected to Fellow of the American Geophysical Union.

In closing, I found out years ago that educational progress is achieved by repetition. So...remember the Life Membership dues option mentioned above? It's only \$250 (or \$270). □

*John Splettstoesser*

*As we prepared to go to press with this issue of The Polar Times, we learned that with a slight redesign of the magazine, we would have the opportunity to run color photographs in pages other than the centerfold, including the inside covers and several more pages of photographs within. We've also increased the number of pages overall. We hope you like the results!—Cliff Bekkedahl, Editor, The Polar Times.*

# The American Polar Society: Past, Present and Future

by Raimund E. Goerler and Lynn Lay (Byrd Polar Research Center, The Ohio State University)

## **T**he Polar Times: Volume 1, Number—

The first issue of *The Polar Times* appeared in June 1935. It brought news of interest to explorers, arm-chair explorers and polar enthusiasts excited by tales of adventure. Of course, much of the issue focused on Byrd's second expedition and that of Ellsworth. The paper also included stories of adventure in the Arctic, plans by Sir Hubert Wilkins for a submarine expedition beneath the Arctic Ice and Soviet activities in polar regions. For the explorer-in-waiting, there were useful articles about tractors in polar work and surveying in Antarctica. Historians then, and even now, appreciated the biographical information contained in obituaries of famous figures in polar exploration and scientific discovery.

Howard's interest in polar environments, his vision for the American Polar Society and his work in creating and sustaining the Society and its *Polar Times* earned him a lasting memorial. Two places in Antarctica owe their names to him. In 1948, Cape Howard on the Weddell Sea was named in honor of August Howard, and a glacier bears the name of *The Polar Times*. Ironically, Howard never had the opportunity to visit Antarctica before his death on December 4, 1988.

## **Activities of the American Polar Society**

As famous polar explorers such as Hubert Wilkins, Richard Byrd, Richard Black, Bernt Balchen and Finn Ronne joined the APS, the organization continued after 1935. Created in the midst of the Great Depression, the APS also survived the distractions of World War II, which turned the attention of Americans to other parts of the earth. By 1947, the APS had doubled its membership to 500 members in 41 states and 16 foreign lands. Two years later, August Howard reported that membership had again more than doubled to 1,319. Much of this dramatic increase was due to Operation Highjump, which exposed some 1,100 soldiers and scientists to Antarctica in 1946 and 1947.

The APS flourished despite the challenges of war and financial adversity by directing the energy and enthusiasm of its members into a variety of activities, in addition to gathering news for *The Polar Times*. One effort, headed by first president and distinguished polar scientist Paul Siple, was to organize committees to report the news of scientific activities for a popular audience. In 1949, Siple had the responsibility of coordinating committees based on 21 subjects

*[Editor's Note: This article, the second of two installments, is adapted from a paper of the same title in Juli Braund-Allen and Cathie Innes-Taylor, editors, "Creativity, Lighting the Poles: Collaborative Solutions to Common Problems: Proceedings of the 16th Polar Libraries Colloquy" (Anchorage: University of Alaska Anchorage Press, 1997), pp. 40-45.]*



COURTESY ALAN HOWARD

## **APS Founder August Howard**

dealing with polar regions. Unfortunately, no documentation exists of the work of these committees.

## **Honorary Members**

Drawing attention to noteworthy polar explorers and scientists was another important activity of the APS. Beginning in 1936, the APS designated as "Honorary Members" those explorers and scientists who had distinguished themselves in polar activities. The first was David L. Brainard of the Adolphus Greely expedition (1881-84). Thereafter, many others received that honor, including Richard Byrd, Vilhjalmur Stefansson, Lincoln Ellsworth, Lawrence McKinley Gould and Louise A. Boyd. In the process of selecting its honorary members, the APS issued press releases and succeeded in making both members and non-members aware of the importance of polar work.

Another activity that drew attention to the Society and to polar achievements was the celebration of polar anniversaries. In 1949 and in 1959, for example, the APS arranged a tribute and celebration to commemorate the 40th and 50th anniversaries of Robert Peary's claim to the North Pole. Similarly in 1961, the APS organized a celebration to honor Roald Amundsen, which it held with the Washington Group of the Explorers Club.

Finally, the APS encouraged the formation

of chapters outside New York City. The Washington, D. C. chapter was particularly active; others were in Chicago, Seattle and San Francisco. Each had its own educational and social activities.

Of course, basic reference service continued to be a prominent activity of the APS. The correspondence of the Secretary includes numerous requests from adults and school children for information about Antarctica.

## **The APS in Recent Years**

By 1975 membership in the APS reached a peak of 2,300 members. Thereafter, membership would decline and remain stable at approximately 1600 until 1996, when membership was 965. As of May 25, 2004, according to Membership Chair Charles Lagerbom, the APS had 1,024 U.S. members from all states except South Dakota, of which 13 are complimentary; 19 are honorary; and 127 are life members. There are also 69 foreign members from 14 countries on six continents, as well as 18 libraries and societies from six countries. With a few additional members, the current total APS membership is 1,131—1,169 fewer members than in the peak year of 1975.

A number of factors explain the relative stagnation in membership, despite the increasing numbers of scientists in polar regions. As a clearinghouse of information for scientists, *The Po-*

lar Times had been outstripped by the development of bibliographic data bases. These made the sharing of scientific reports more comprehensive and convenient than *The Polar Times*, which appeared every six months at best.

Another challenge was internal. From its beginning, the APS was a private organization of interested individuals. It had, and still has, no central office or salaried staff. In fact, August Howard and his family sorted newspaper clippings and compiled each issue of *The Polar Times* in their own home and in their leisure hours. From 1948 to 1954, the leisure hours disappeared when August and Rose Howard devoted their time at home to the care and raising of two children. In that period, *The Polar Times* did not publish any issues.

### Changes of the Guard

August Howard died of heart disease on December 4, 1988, at the age of 78. In 1989, the Society designated Peter Anderson of The Byrd Polar Research Center to succeed Mr. Howard. Records and papers of the APS arrived at The

Ohio State University. However, Mr. Anderson suffered a stroke soon after the transfer, preventing him from resuming the work of the APS or publication of *The Polar Times*.

In 1992, the Society turned to one of its members, Captain Brian Shoemaker, to take over the responsibility for *The Polar Times*. In 1993, Shoemaker resumed publication of *The Polar Times* and began seeking new directions. In addition to recruiting members amongst military veterans and scientists, Shoemaker has made the ever-increasing numbers of tourists to Antarctica aware of the APS and its publication.

Shoemaker also co-developed, in collaboration with the Byrd Polar Research Center Archival Program and members of the Byrd Polar Research Center staff, an oral history program in which many dozens of scientists and veterans of polar expeditions have been interviewed. The project is funded by the National Science Foundation, and documentation of the interviews is deposited, preserved and made available at the Byrd Polar Research Center at Ohio State University.

In the Summer 2000 issue of *The Polar Times*, Brian Shoemaker ran a small ad seeking volunteers to assist with various functions in the Society and *The Polar Times*. The response, while not overwhelming, achieved his goal of parsing the functions that he was performing singlehandedly and, hopefully, by the division of responsibility, would enhance the overall effectiveness of the Society by focusing efforts on increasing membership and leavening the content of *The Polar Times*. This turnover brought Captain Frank Stokes to the position of Secretary of the APS; Captain Cliff Bekkedahl as Editor of *The Polar Times*; Jeff Rubin, author and journalist, as Antarctica editor; and Professor Dave Norton as Arctic editor. On the administrative side, Bob Kremenak chaired the Membership position, and Dave Baker became Treasurer. This new cast of volunteers by sheer numbers alone is a testament to the dedication of Captain Brian Shoemaker who for years fulfilled these functions by himself. □

## Polar Bug

**Editor's Note:** Under the headline "Specialist," the *New Yorker* magazine (pp 19-20) of February 1, 1947, ran in its "Talk of the Town" section the following profile of American Polar Society founder August Howard.

One of the less well-known publishers of the city is Mr. August Howard, a man who divides his time between the Boy Scouts of America headquarters at 2 Park Avenue and his home at Long Beach, and issues *The Polar Times*, a semi-annual journal. Howard has long been a staff worker at the Scouts' national offices, and it was there we found him last week and learned how an interest in Scouting led to a devotion to the polar regions. In 1927, Admiral Byrd, exuberant over having flown the Atlantic, wrote to the Boy Scouts of France that he would be willing to take a Scout along on the trip to Antarctica he planned for the following year. The French Scouts expressed hearty approval, and that was that, so far as they were concerned. But the letter was printed in the American press, and hundreds of American Scouts wrote in, asking to accompany him. He delegated the choice to National Headquarters, which picked Paul Siple, a Sea Scout. Off Siple went to Little America, and off went Howard to his desk to do right by the relatives and friends of Siple, including the twenty-five members of his Sea Scout ship, by getting out for them a mimeographed monthly paper he called the *Metropolitan Pilot*, which consisted largely of reprints of newspaper articles telling of Siple's explorative adventures. By the time Howard had completed this self-assignment, he was a polar bug. In 1933, during Byrd's second expedition to the Antarctic, he enlarged his frame of reference to include the expedition as a whole and started the *Little America Times*, which lasted eighteen months and was distributed to the families and friends of Byrd's outfit. In 1935, he converted this publication into *The Polar Times*

and has kept it going ever since, on a twice-a-year basis. He culls most of its contents from various scientific publications, the only moderately polar *Times*, the *Herald Tribune*, the *Christian Science Monitor* and lesser sources. He recently got a dandy piece on Chilean plans for Antarctic exploration from the *Brooklyn Eagle*.

Although Howard has never been very far north or south of Thirty-third Street, his editorial work has made him a top-rank polar expert. He has amassed a library of two hundred volumes on polar matters—many the gift of explorer-authors—and he was the founder, twelve years ago, of the American Polar Society, the membership of which numbers about five hundred—including Sir Hubert Wilkins, naturally—and comprises the subscription list of *The Polar Times*. About half of the members have visited a polar region. Siple is now a Ph.D., an explorer, an ex-lieutenant colonel and, as a civilian employee of the War Department, the Army's senior representative on the Navy's present expedition to Little America. He was the Society's first president and, during the war, served as chief of the Climatology and Environmental Protection Section, Research and Development Branch, Office of the Quartermaster General of the Army; he received few letters from the home folks, because they couldn't get all that on an envelope. He tested and developed clothing for wear in various extreme climates. The Society keeps an index of polar areas its members have visited so that explorers contemplating a trip to a particular spot can find out who has been there before and query them as to conditions. Ignorance of such, Mr. Howard told us, is rife, despite *The Polar Times*. "Lots of people," he said sadly, "believe that penguins can fly, that there are polar bears at the South Pole and that the Arctic Sea is an ocean. Few realize that Antarctica was once a dense tropic, but if you recall the immense coal deposits there, you see the truth of that in a minute." Howard also remarked



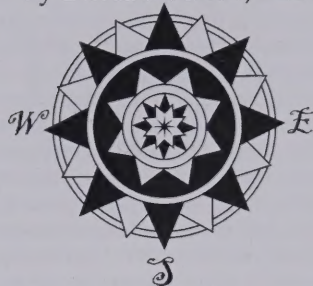
COURTESY ALAN HOWARD

that most people think that Antarctica is inhabited by permanent residents and, in this connection, told us that this year it is astonishingly well populated, but by transients. With the Byrd and a British expedition and seventeen whaling fleets, it has a current population—mostly afloat, of course—of about fifteen thousand.

Howard is a man of high, but not unbending, semasiological standards. As he uses it, the word "polar" applies to all territories where polar conditions prevail and not just to areas enclosed by the Arctic and Antarctic circles. Thus, Norway, which is partly north of the Arctic Circle, is excluded from *The Polar Times'* orbit while Labrador, which is entirely south of the Circle, is included. So, as a romantic exception, are the Aleutian Islands, where conditions are far from pre-vaillingly polar. *The Polar Times* has one competitor, *The Polar Record*, published by the Scott Polar Research Institute of Cambridge, England, and in respect to it, Howard convinces an unusual and gratifying broadmindedness. Every issue of his paper contains a box urging subscribers to read the *Record*. □

# Due North

by David Norton, Arctic Editor



Responding to an invitation to address social scientists planning for the upcoming Fourth International Polar Year (IPY) in 2007-2008, I have probed the histories of previous Polar Year experiences, especially the first. In 1881-83, no less than 14 expeditions by various national contributors were the “originals” that ventured to northern (12) and southern (2) high-latitude regions.

That first International Polar Year has justifiably stimulated fascination by North Americans, both then and now. The United States (barely 100 years a nation, mind you) mounted two expeditions. Out of this tally of 14 expeditions, nine were major. The British, the Dutch, the Austro-Hungarians, the Swedes and the French managed one apiece, while the Russians were the only other nation to mobilize two. Both U.S. ventures were under the direction of the U.S. Army, still recovering from divisiveness of the U.S. Civil War (1861-1865). Just possibly, the expeditions were also stoked by the recent acquisition of Alaska (1867).

The more famous of two North American expeditions was the one under the command of Adolphus Greely, whose original party of 25 set up on Ellesmere Island in Canada. Only six starving men near death could be rescued by long overdue recovery parties in early 1884, after terrible deprivations. Survivors, however, had safeguarded every bit of geophysical and other data they had been assigned to bring home. They were national and international heroes.

*The world was just beginning to sense itself—at least at lower latitudes—as a global village in the 1880s.*

The less famous U.S. contribution to the first IPY went to Barrow under the direction of Lt. [Patrick] H[enry] Ray. For opposite reasons, his corps of nine observers deserves as much honour as Greely's team. The Ray Expedition succeeded by every measure. Its command was self-effacing, in hindsight exemplary of leadership so untroubled by fuss as to make it easy for historians to overlook. In 27 months away from home, not a single party member was sick for a day. The group operating from the observatory they built (at what became the Cape Smythe commercial whaling station and is now known as the Browerville section

## What If Krakatoa's Explosion Had Been Detected During The First International Polar Year?

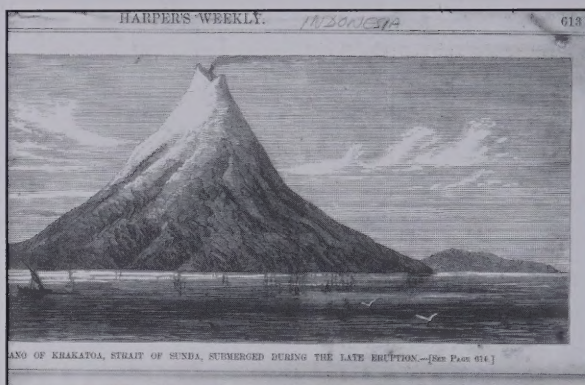
of modern Barrow) depended unabashedly on the expertise and friendship of Iñupiat residents. Reciprocated respect between Iñupiat and expedition personnel established a precedent that endures even today, such that Barrow is nicknamed “Science City.”

While developing my sense of the personalities of original IPY expeditionary parties, I chanced to notice an odd coincidence. The date on which the Ray Expedition packed up its instruments at Barrow was 27 August 1883. Far away on edges of two of the planet's great tectonic plates, Krakatoa's towering volcanic cone in Sunda Strait (modern Indonesia) exploded on 27 August 1883. The event was felt directly and indirectly around the world for several years.

Historians and scientists find it instructive to engage in “what if” exercises. In this case, the question takes the form of, “What if the first IPY observations had continued a year or two beyond the explosion of Krakatoa?” That they did not is remarkable. Considering how unevenly in time the 14 expeditions began, most of the important observations shut down quite synchronously. The signal, a major perturbation injected into the atmosphere by Krakatoa's explosion, would almost certainly have shown up within six to 18 months at each of the IPY observatories vacated so near 27 August 1883.

For full significance behind this “what if?” exercise, we need to recall one of the great debates polarising 19th century natural philosophers (as scientists once called themselves). The “gradualist” or “uniformitarianism” camp viewed the geological and fossil evidence of Earth's past and argued that enormous amounts of time must have elapsed to allow for gradual change in a relatively stable planet. Throughout deep time, they argued, the same serene pace of 19th century Europe's and North America's changes had been in effect. Charles Darwin's theory of natural selection to explain the evolution of species had been published a quarter century before the first International Polar Year. Darwin's construct seemed firmly rooted in the soil of gradualist philosophy and gradual change itself.

The “catastrophist” camp was dealt a blow by uniformitarians' geological evidence and natural selection theory. Scriptural reliance on the catastrophic Mosaic Flood to explain 19th century geological observations of the northern hemisphere had largely given way to a belief that glaciers of an earlier, but still relatively recent Ice Age (Pleistocene) had shaped vast areas of



From Harper's Weekly, 27 August 1883: a view of the volcano Krakatoa before its explosive eruption.

the northern European and North American surface features.

And so things stood, until after the middle of the 20th century: Uniformitarianism subtly dominated thinking by most scientists and how they linked

their observations to public policy. Over decades in western nations, for example, natural areas were set aside to conserve their stable communities of wild organisms, in an idyllic, Eden-like innocence of the threat of change.

Ironically, we have experienced an almost imperceptible, or “gradual,” resurgence of catastrophism since the late 20th century. Stephen Jay Gould and Niles Eldridge found evidence in reviewing the fossil record of something they called “punctuated equilibrium,” in which the punctuations were catastrophic episodes of widespread extinctions. The end of the Mesozoic Era and the beginning of the Tertiary Era are now widely believed to have been punctuated by a huge catastrophe in the form of one or a series of comets or asteroids striking Earth about 65 million years ago—the event best known for removing all species of dinosaurs from their long dominance of terrestrial environments worldwide.

Nowadays, we have become so attuned to the constancy of public discussions of catastrophic change and the perpetual threat of change that we perhaps do not think of this mindset as the return of catastrophism to our perceptions. We are undeniably in the midst of a period of massive species extinctions that rivals Gould's biggest events of punctuating the equilibrium. Global change is on everyone's mind, it seems.

We can never know for sure, of course, but it makes for interesting speculation to imagine the first IPY observers coping with evidence that Krakatoa's explosion was radiating worldwide effects within months of 27 August 1883. The world was just beginning to sense itself—at least at lower latitudes—as a global village in the 1880s. Telegraphy across submarine cables brought the news of Krakatoa's explosion within hours or days. Just how much faster *would* we have restored parity between uniformitarianism and catastrophism if most of the original 14 IPY expeditions had been in place to watch their needles jump and their sunsets grow eerily brilliant? □

### Readings:

Winchester, S. 2003. Krakatoa: The day the world exploded: August 27, 1883. New York NY: HarperCollins.

Barr, W. 1985. The expeditions of the first International Polar Year, 1882-83. Calgary AB: Arctic Institute of North America, Technical Paper No. 29.

## Researchers Aim To Define Excess

**Thule Air Base, GREENLAND, by Heidi Steltzer**—A chunk, a hunk, or a drunk are the three alternate states in which one can leave Thule Air Base, or so I was told. The American military stationed there have coined this phrase over the years to characterize the limited options for free-time recreational activities. Indeed, couch surfing, working out or partying at the club are activities available to those living at Thule. Each could become an extreme sport with alternate consequences when taken to excess—although none really are. Yet, this remote region of the Arctic challenges us to define whether heat could be excessive for the plants of this region. With the average annual temperature well below freezing, one could easily reason that a little extra warmth could be beneficial. As climate warms in the Thule region, can there be too much of a good thing?

Climatic control over plant survival and growth in these cold, dry desert landscapes is one component of a research project currently being conducted at Thule Air Base. When Dr. Jeff Welker, the lead investigator on this U.S. National Science Foundation (NSF) Biocomplexity grant, offered me a position to work there, I had never heard of Thule, despite its historical significance in polar exploration and its key role in Cold War defense. Thule, a Norse word for the farthest north place, aptly describes the region for me, as it is the farthest north I have ever traveled, and not much land lies north of 76° latitude (*Ed. Note: see Peter Skafte's "Search for Ultima Thule" Part 1, pp. 3-4 this issue*). The Air Force has monitored the climate there since 1953. The base was founded in 1951, and the pattern of climate change at Thule parallels the patterns found in other areas of the Arctic. Through the 50s and 60s, climate cooled; but since the early 70s, the climate has warmed.

The extreme environment of these northern desert landscapes is cold, but it is also dry. Where water availability is low, plants develop conservative strategies to minimize water loss. Think about the cacti of the warm deserts in the southwestern United States. For plants to grow bigger, they need to photosynthesize, a process that converts carbon dioxide from the air into sugars within the plant. The cost of photosynthesis is

water that is lost from the plant as it allows the carbon dioxide into a leaf. Thus, carbon gain and growth are coupled to water loss.

Adding heat allows plants to increase rates of photosynthesis but results in greater water loss. Even so, some plants might be able to take advantage of this added heat. Others might not, because the cost of losing too much water is a sacrifice they are not programmed to make, especially since the added heat can cause evaporative loss of water—like a puddle drying up—reducing water availability relative to the cooler conditions. To test how the balance of heat and water availability will affect plant growth, our research team has set up an experiment using heat lamps to warm the tundra, irrigating to increase water availability, and in some plots adding both heat and water. This experiment will help us to understand whether a little extra heat is too much for these cold-adapted and water-limited plants that remove carbon from the atmosphere and sustain the snowshoe hares.

Another research team, this one from Denmark, has also chosen Thule as a site to characterize excess, but the Danes aim to understand what factors contribute to obesity. No, they won't be using the Thule couch surfers as study subjects, but instead chose Thule as the site for their study, because of the unique physiology of the native Greenlanders. Greenlanders living a subsistence lifestyle may eat less and actively hunt for their food, yet they also process lipids, or fat, better than the average Dane. The Greenlanders' physiology allows them to utilize



PHOTO BY H. STELTZER

**Heat supplied by infrared lamps is warming the High Arctic tundra and, combined with irrigation, will test how the plants will respond to climate change and whether herbivores such as hares will benefit.**

lipids to power their muscles, potentially reducing their accumulation of fat. To figure out what contributes to their utilization of fat—genes, lifestyle or diet—the Danish research team has headed to Thule with a group of eight Danes who, along with eight Greenlanders, will follow the same exercise regimen and diet over a two-month period. But don't expect Thule to become the next "hot spot" for planning a spa vacation. It could be the Inuit genes and not the dogsledding that enables their bodies to burn fat, and the warming climate is reducing the window of time when dogsledding out on the sea ice is feasible. ☐ **Heidi Steltzer is a research scientist at the Natural Resource Ecology Laboratory at Colorado State University. She is also an affiliate at the Institute of Arctic and Alpine Research at the University of Colorado at Boulder where she completed her Ph.D. in 1999. She strives to connect research and exploration through her current projects on global change and nutrient cycling in Arctic landscapes.**

## A Drink? The Ice Is Vintage

**New York Times Online, 1 June 2004, by Andrew C. Revkin**—To a good scientist, everything is a question.

That was the case in Kangerlussuaq, Greenland, on a recent Friday night, when weary scientists and research staff gathered for farewells before flying home after weeks of grueling fieldwork on the two-mile-high ice cap that cloaks the giant Arctic island. Many had spent weeks in 30-below-zero weather, extracting cores of ice, which contain clues to climate past and hints of the future.

Now, it was time to relax.

In the kitchen of a red prefab residence building, the group dined on grilled burgers and a salad speck-

led with pine nuts and Greek olives.

Someone pulled out a plastic bag filled with unusable chunks of the ice cores.

The scientists call it "party ice." The name refers to the fizz and pop that occur when bubbles of ancient, pressurized air escape as the ice melts in a liquid.

This batch was labeled "144 m," reflecting the depth it had come from (about 470 feet down), 140 years back in time. The greater the depth, the more the air is compressed and the louder the sound.

But there is another possible variable: Dr. Joseph R. McConnell, a snow and ice expert from the Desert Research Institute in Reno, Nev., said lore had it that

party ice makes more noise in an alcoholic beverage than in, say, juice or water.

A controlled experiment was proposed.

Glasses of Ballantine's Scotch, Feeney's Irish Cream Liqueur, Danish Gammel Dansk bitters and several other beverages with varying alcohol concentrations were meticulously lined up on a table. Pieces of ice were plopped into each glass and ears bent low to assess which samples fizzled loudest.

A paper has yet to be submitted for publication, but the researchers on hand quickly came to a conclusion that often results from scientific analysis:

Further research was required. ☐

# Out Of Gas—The End Of The Age Of Oil

reviewed by Cliff Bekkedahl, Editor, The Polar Times

Oil and gas from the Arctic regions, global warming and the greenhouse effect and associated environmental issues are topical subjects that have found their way into the pages of *The Polar Times* for more than several years now. So it is that *Out Of Gas—The End Of The Age Of Oil* by David Goodstein (W.W. Norton & Co., copyright 2004) is recommended to your attention.

This thin, fast-read and riveting book by David Goodstein, vice provost and professor at the California Institute of Technology, is aimed at the concerned, non-technical citizen, as the world approaches the first half of the first decade of a century in which the earth will run out of conventionally produced cheap oil. And in case you're wondering, stocks of natural gas and coal will likely be depleted very soon thereafter. If you are of an age that thinks first of your grandchildren, this is a devastating concept with which to come to grips. How and with what will mankind replace this fossil fuel energy source? And, if it is to be this century when the pump runs dry, how soon do we have to start marshalling our intellectual, political and technological resources to effect a transition to new and different energy sources? Professor Goodstein poses these questions and suggests some directions that will have to be taken, but the thrust of this book is to explain the basis for the sobering prediction of the

exhaustion of the earth's fossil energy stocks.

In the 1950s, Shell Oil geophysicist M. King Hubbert predicted that the rate at which oil could be extracted from wells in the United States would peak around 1970 and decline rapidly after that. While his prediction was not welcomed by his peers, he turned out to be right, dead right! In fact, so right that all oil companies now routinely use Hubbert's methods to predict future yields of existing oil fields.

Recently a number of oil geologists have applied Hubbert's techniques to the oil supply of the entire world and, while not agreeing precisely as to when, they all agree that the world supply will peak, perhaps in this decade and then begin to decline forever. Central to Hubbert's calculations is the notion that once the rate of discovery of new oil begins to decline, it is possible to extrapolate the declining rate to find where growth will stop. At that point all the oil in the ground will have been discovered, and the total amount there ever was is equal to what's in the ground and what's already been used.

From 1995 to 2000 the United States Geological Survey (USGS) made an exhaustive study of worldwide oil supplies and came to the conclusion that there were two trillion barrels of oil in the ground when the world began pumping. The certainty of this number was 95 percent. Further study offered the possibility (50 percent certainty)

that the two trillion could be increased to 2.7 trillion which would be equivalent to finding another Saudi Arabia oil field, a possibility that almost all oil geologists consider highly unlikely. Even so, using the 2.7 trillion figure and subtracting that which has already been extracted and used (about a trillion barrels) that leaves us at Hubbert's peak with the producers now pumping the last half of the total supply. At current and projected rates of demand that last trillion or so barrels of oil will run out before the end of this century.

Professor Goodstein addresses alternative fossil fuels, shale, coal, natural gas and exotica like methane hydrate and does not find them to be long term solutions—they too are subject to Hubbert's peak, and the environmental downside of these fuels could be catastrophic.

Readers, like this writer, will find "yes, but's" coming instantly to mind; however, the author carefully deconstructs the conventional wisdom and oil patch propaganda to leave the reader confronting a sobering set of alternatives that will challenge the world's political and technological leaders. Surely the latter will rise to the challenge, but judged by contemporary events, the former may not have the courage or integrity to do what absolutely must be done. Get hold of a copy of this book and then think about how your grandchildren will live in a world no longer energized by fossil fuels. □

## Oceanites Project Looking for Support

Oceanites, Inc., began its Antarctic Site Inventory Project in 1994 with objectives to "compile baseline data and information that may be necessary to detect possible changes in the physical and biological variables monitored and to determine how best to minimize or avoid possible environmental impacts of tourism and non-governmental activities in the Antarctic Peninsula area" (from a recent Oceanites publication). The project is under the direction of Mr. Ron Naveen from Washington, D.C. Site visits are achieved by placing Antarctic Site Inventory researchers aboard tour ships at key census times each austral spring and summer, coinciding with peaks in the penguin breeding cycle.

In the 2003-04 field season, pursuant to a new, five-year grant award—from the U.S. National Science Foundation's Office of Polar Programs—Oceanites and the Inventory began a focused assessment and monitoring program at Petermann Island (65°10'S, 64°10'W), a highly visited Peninsula location.

Censuses of Antarctic penguins and other seabird breeding behavior and populations can be important indicators (bellwethers) of changes in regional climate and ice conditions, as well as human visitation to their breeding sites. Without baseline information taken over a long period of time, it would be difficult to ascertain cumulative effects that might be a result of natural variations,

human visitors or unknown factors yet to be recognized. Naveen's results to date have been impressive by virtue of several articles in technical journals, as well as a voluminous "Compendium of Antarctic Peninsula Visitor Sites," a 1997 report to the U.S. and U.K. governments. A second edition of the Compendium was released in March 2004, supplementing the first with additional data. Naveen also authored a "Site Guide to the Antarctic Peninsula," consisting of highlights of many locations visited by tourists and including generalized field maps and photographs for the general public, a very useful guide for those on tourist cruises. More information on Naveen himself can be found in his book, *Waiting to Fly: My Escapades with the Penguins of Antarctica*, published by William Morrow in 1999. Summaries of data collected by the Inventory are presented on an annual basis to the Antarctic Treaty Consultative Meetings.

The Oceanites' website is the next step in this process and is envisioned as the primary vehicle for disseminating relevant/necessary data and information, maps and photography to the Antarctic community at large—diplomats, scientists, conservation organizations and the general public, in this way nurturing the conservation of Antarctica for posterity. A unique educational component will be included in the website: a virtual classroom that will allow access to a wealth of slide show or Powerpoint presentations, vid-

eos and downloadable materials. Because the Antarctic Treaty operates in four official languages, the website will eventually be available in English and Spanish (initially), French and Russian. A preliminary flowchart of the website, still partly under construction, was provided to the APS for examination and use for discussion and potential support of the project. Estimates are that the high-design threshold of a site that is both interactive and visually appealing will involve start-up costs in the \$40,000–\$50,000 range. Support for Oceanites and its Site Inventory has previously included grants from the National Science Foundation's Office of Polar Programs; U.S. Marine Mammal Commission; UK Foreign and Commonwealth Office, U.S. Environmental Protection Agency; German Federal Environmental Agency, Antarctic tour operators under the aegis of IAATO; and several private foundations and individuals. It is one of many polar organizations that members of the American Polar Society might consider for individual support. Address yours to Oceanites at P.O. Box 15259, Chevy Chase, Maryland 20825; oceanites@aol.com.

Another example of a polar-related organization to which you may lend support is that of Wilderness Research Foundation (Sheldon Bart at WildResch@aol.com; see "Wilderness Research Foundation Aims for High Arctic," this issue, p. 12). □

# Arctic Oil and Gas Digest

*Assembled by Dave Norton, Arctic Editor*

**Editor's Note:** As this half-yearly issue of *The Polar Times* goes to press, about the only energy matters that seem assured are that crude oil is likely to cost above \$30 per barrel for a while, the cost of a gallon of gasoline may never again retreat below \$2.00 in most of the U.S., and legislators seem unable or unwilling to restructure the operating budget for the State of Alaska away from its dependence on petroleum revenues. In broad terms, we have yet to come to grips with a global energy economy in which Iraqi petroleum is insignificant, replacement energy technologies look far-off, China's petroleum consumption has reached 7 percent of the world's share, its annual growth in consumption is 30 percent, and Wal-Mart is now China's 6th largest trading partner.

## Interior Finishes Plan on Alaska Drilling

**Associated Press, WASHINGTON, 22 January 2004, by John Heilprin**—Interior Secretary Gale Norton signed off on a plan Thursday for opening most of an 8.8 million-acre swath of Alaska's North Slope to oil and gas development. Some of the drilling could occur in areas important for migratory birds, whales and wildlife.

The Interior Department's Bureau of Land Management will use the plan to manage a northwest portion of the government's 23.5 million-acre National Petroleum Reserve-Alaska. Geologists believe the reserve may contain 6 billion to 13 billion barrels of oil.

It is located just west of the Arctic National Wildlife Refuge, where President Bush wants to open a 1.5 million-acre coastal plain to drilling as one of his top energy priorities. The Senate, in debating a massive energy bill, has rejected drilling there.

Environmentalists said the management plan threatens the health of Arctic tundra, ponds and lakes that are home to wildlife and migratory birds and provide a vital subsistence hunting and fishing ground for native Alaskans.

"It makes no sense to industrialize this incomparable wilderness area when there's only about six month's worth of economically recoverable oil ... and it would take at least 10 years to get it to market," said Charles Clusen, director of the Alaska lands project for the Natural Resources Defense Council, an environmental group.

The plan makes 7.23 million acres available for energy leasing, but will defer leasing the other 1.57 million acres for a decade to see if more environmental studies are needed, Interior Department officials said.

All energy leases will be subject to strict environmental standards, the officials said, while other provisions are meant to protect water quality, vegetation, wetlands, fish and wildlife habitats and subsistence uses.

The Interior Department proposed the management plan in January 2003. With few changes, the plan includes creation of a 102,000-acre Kasegaluk Lagoon Special Area fenced off from leasing. It is considered particularly sensitive, as it is home to beluga whales, spotted seals and the black brandt, a migratory wild goose.

The plan designates special study areas of more than a half-million acres each for the Pacific black brandt and caribou. It also requires habitat studies for eiders, a bird whose existence is imperiled, and yellow-billed loons, and sets restrictions to minimize loss of foraging habitat for raptors around the Colville River Special Area.

Norton said oil and gas from the North Slope will help increase domestic energy production and stabilize prices in the long term.

"This plan will help produce energy in an environmentally responsible manner with the best available technology, while protecting the important biological, subsistence and cultural values found in this area," she said.

The reserve was set aside in the 1920s for potential energy development.

Environmentalists said the management plan rewards Bush administration friends in the oil and gas industry.

"This decision certainly gives big oil and gas plenty to be thankful for," said Eleanor Huffines, regional director in Alaska for The Wilderness Society.

BLM can now modify or waive environmental safeguards on a case-by-case basis for economic reasons, environmentalists said.

The bureau expects to hold a lease sale for oil and gas development on selected tracts next June. The Clinton administration had opened much of the eastern section of the reserve to oil and gas exploration in 1998, with tight restrictions and some areas fenced off. □

## Study Downplays Alaska Refuge's Impact

**Associated Press, WASHINGTON, 16 March 2004, by H. Josef Hebert**—Opening an Alaska wildlife refuge to oil development would only slightly reduce America's dependence on imports and would lower oil prices by less than 50 cents a barrel, said an Energy Department analysis released Tuesday.

The report by the Energy Information Administration said that if Congress gave the go-ahead to pump oil from Alaska's Arctic National Wildlife Refuge, the crude could begin flowing by 2013 and reach a peak of 876,000 barrels a day by 2025.

But even at peak production, said the EIA analysis, the United States would still have to import two-thirds of its oil, as opposed to an expected 70 percent if the refuge's oil remains off the market.

At the same time, the report said that new Alaska production would stem the expected dramatic decline in domestic production and extend the economic life of the Alaska oil pipeline as production from other North Slope areas declines significantly.

But even the additional domestic production would not be enough to overcome increased demand, meaning continued heavy reliance on imports, said the EIA. Currently the United States imports about 56 percent of the oil it consumes.

Congress has grappled for years over whether to allow oil companies access to the Alaska refuge's 1.5 million acre coastal plain, which is believed by geologists to harbor about 10.4 billion barrels of crude.

Last year the House, citing the need for more domestic oil to ease the reliance on imports, gave a green light to drilling in the refuge, but the Senate

refused to go along.

Many Senate Democrats, joined by a handful of moderate Republicans, repeatedly have blocked pro-drilling legislation, arguing the refuge would be harmed ecologically. The coastal plain includes calving areas for caribou and is home to polar bears and other wildlife, as well as being a stopover for an annual migration of millions of birds.

Both sides in the ANWR issue likely will use the latest EIA report as ammunition in the next round of debate over energy legislation in Congress.

Rep. Richard Pombo, R-Calif., chairman of the House Resources Committee, on Tuesday seized on the finding that ANWR development would boost domestic oil production by 20 percent over what it otherwise would be in 2025.

"Given America's energy crunch ANWR production is a must," Pombo, who requested the EIA analysis, said in a statement.

But environmentalists said the findings debunk arguments pushed by the Bush administration and other pro-drilling advocates that the refuge is important for national security and economic independence.

"It underscores what we've been saying all along, that oil drilling in the refuge would do next to nothing to actually meet America's energy needs. ... We're still going to be reliant, if not more reliant, on foreign sources of oil," said Justin Tatham of the U.S. Public Interest Research Group, an environmental organization active in protecting the refuge from development.

The EIA study also noted the importance of ANWR's oil to Alaska.

Without the refuge's development, oil flowing from the North Slope will fall to 500,000 barrels a day - half of current levels - by 2025, and approach levels where the pipeline may no longer be economical to operate, the report said.

U.S. domestic oil production will increase over the next four years from the current 5.7 million barrels a day to 6.1 million barrels a day, largely because of additional oil coming from the Gulf of Mexico, according to the EIA report.

But after that, domestic production declines steadily without access to the ANWR coastal plain, and is expected to fall to 4.6 million barrels a day by 2025. With demand increasing, imports will continue to play a larger role, jumping from 9.7 million barrels a day to nearly 16 million barrels a day, roughly 70 percent of what is consumed by 2025.

With ANWR's 876,000 barrels a day, the reliance on imports would drop to 66 percent of domestic consumption, said the EIA analysis. And the study said it would likely have little impact on world oil prices—perhaps reducing the price by 30 to 50 cents a barrel if prices were in the \$27 a barrel range.

The price of light sweet crude was \$37.48 per barrel on Tuesday on the New York Mercantile Exchange.

James Kendell, one of the authors of the study, said the refuge would add to domestic production but "when you're talking of a world oil market of over 75 million barrels a day, adding 900,000 barrels by 2025 is a drop in the bucket."

No one is certain how much oil is beneath the ANWR coastal plain. In assuming 876,000 barrel a day production, the EIA assumed the "mean" esti-

mate provided by geologists of 10.4 billion barrels of technically recoverable reserves. Geologists say there could be less or much more. Environmentalists argue that much of that oil may not be economically recoverable if oil prices decline. □

### **Alaska Governor Invites U.S. Oil Drilling**

**Associated Press, JUNEAU, Alaska, 1 April 2004, by Mike Chambers**—Gov. Frank Murkowski said he would open lease sales in state waters offshore of the Arctic National Wildlife Refuge and the National Petroleum Reserve-Alaska.

Citing frustration with what he calls "America's extreme environmental community," Murkowski said Wednesday he will do what he can as governor to spur Arctic oil development.

"While the U.S. House and Senate remain gridlocked over opening ANWR for oil development, I am not burdened by that process," said Murkowski, who spent 22 years in the U.S. Senate before becoming governor in 2002.

The oil and gas lease sales are planned for October. State waters extend out 3 miles in the Chukchi and Beaufort seas.

It is unclear how much of the area will be leased, but the two areas amount to about 1 million acres. About 670,000 acres of submerged lands lie off the coast of the petroleum reserve and 350,000 acres are off the coast of the wildlife refuge.

The lease sales, scheduled for October, could lead to oil production wells to offset the nation's dependence on foreign oil, Murkowski said.

"It seems like a kind of foolish attempt at brinkmanship on the part of Gov. Murkowski," said Matthew Niemerski, spokesman for Defenders of Wildlife.

Some areas offshore of the petroleum reserve have been leased and are producing oil, Murkowski said. These include the Northstar, Point McIntyre and Endicott fields.

The lease sales could affect areas set aside by the state to protect whales, which are still hunted by Alaska Natives.

Current offshore drilling activity already has forced hunters to go farther out to sea for their whale hunts, said state Sen. Donny Olson, a Democrat whose district spans the federal areas.

Murkowski said he is sensitive to concerns of potential harm caused to Alaska Native subsistence whaling and is willing to mitigate impact on whales.

He said he ordered Department of Natural Resources Commissioner Tom Irwin to work with North Slope communities. □

### **Enbridge files application for gas pipeline**

**Associated Press, ANCHORAGE, 5 May 2004**—A Canadian energy transportation company has filed an application under Alaska's Stranded Gas Development Act to negotiate a contract to build a natural gas pipeline from the North Slope to the Canadian border.

Enbridge Inc.'s president and chief executive Patrick D. Daniel said the company plans to be a leader in the pipeline's development, but the project will need cooperation from several parties.

"We strongly believe our application provides a competitive alternative to other pipeline proposals. Ultimately, this project will be developed by the parties that can bring together a wide array of public, private and commercial interests," Daniel said in a statement.

With the application, Enbridge can begin formal negotiations with the state on building the pipeline from Prudhoe Bay to the Yukon border.

Gov. Frank Murkowski's office called Enbridge's application a significant step forward in the project.

The state is in negotiations with the major North Slope producers, BP Exploration, ConocoPhillips, and ExxonMobil on another stranded gas application.

An application has already been received from the Alaska Gasline Port Authority, a consortium made up of the City of Valdez and the Fairbanks North Star Borough.

A fourth application is expected from TransCanada Corp., which signed a memorandum of understanding with the state on April 19. □

### **Official: Alaska Gas Line Could Use Tax Breaks**

**News-Miner Washington Bureau, WASHINGTON, 7 May 2004, by Sam Bishop**—A top federal energy regulator said Wednesday the proposed Alaska natural gas pipeline could use some financial breaks from the government but a member of his staff clarified later that the statement wasn't an open-ended endorsement of tax incentives.

Pat Wood, chairman of the Federal Energy Regulatory Commission, noted that the proposed gas line is the largest private construction project ever proposed in North America.

"This project is unique," Wood told a subcommittee of the House of Representatives' Energy and Commerce Committee. "This one might need that extra help."

The help he endorsed, though, doesn't include a tax credit for North Slope natural gas producers during periods of low prices—a provision described by some as a price support.

"Generally, he's been supporting the loan guarantees," said Carol Connors, a FERC staff member. "He has never endorsed the provision for price supports."

At least one North Slope gas owner—ConocoPhillips—has said the price-linked tax credit is necessary to make the gas line financially feasible.

President Bush, who brought Wood to FERC from Texas, opposes the tax credit. Bush administration officials say it meddles too much in the market.

The subcommittee chairman, Rep. Ralph Hall, also of Texas, introduced Wood as a champion of deregulating energy markets. Wood is "my kind of bureaucrat," said Hall, who served 12 terms as a House Democrat but switched to the Republican caucus in January.

A House-Senate conference committee in November approved an energy bill with an \$18 billion construction loan guarantee for the natural gas line, but without the price-linked tax credit. The House then passed the bill, but it died in procedural wrangling on the Senate floor.

The tax credit continues to live, though. It has most recently found a home in a Senate bill dealing with an unrelated foreign trade dispute.

Sen. Lisa Murkowski, R-Alaska, told the subcommittee Wednesday that she hopes the provision will make it through the Senate.

"We're hopeful that we will have an opportunity to take that up and resolve that this week," she said. "But the one issue of the price support is something that has been a bone of contention and has generated the most amount of controversy."

The bill also contains two other gas pipeline tax incentives—an accelerated depreciation schedule for the pipeline and a tax credit for the proposed North Slope gas conditioning plant.

"So I'm hopeful that we will be able to keep all of the tax incentives ... in the bill," Murkowski said. "We need to do all that we can at the federal level to facili-

tate construction of this incredibly massive project. We're talking about a \$20 billion project."

If the Senate passes the incentives, they still would need approval in the House, where the leadership has also opposed the price-linked tax credit.

Murkowski left the justifications for industry officials who also testified.

Under the proposal, the tax credit would kick in whenever the wellhead value of Alaska gas fell below \$1.35 per thousand cubic feet. The credit would let gas producers reduce their taxes by an amount equivalent to the money lost to prices below that level, but only up to a point. If prices fell below 83 cents per tcf, no more tax credit could be secured by gas producers.

"I've heard the vocabulary 'price floor' a couple times," said Ken Konrad, BP Alaska's senior vice president for gas. "I believe members of this committee are clear that the production tax credit being considered is a 52 cent credit. It is not a floor. It never exceeds 52 cents."

Prices are above the level at which the tax credit would kick in. Wood noted that yesterday's price in Houston topped \$6. Even accounting for the expected cost of the proposed pipeline, that would leave well-head prices far higher than \$1.35.

However, it's not current prices that companies worry about, officials said.

"Prices don't need to increase further than they are today to make the project viable," said John Carruthers, vice president of Enbridge, a Canadian pipeline company hoping to build a line. "In all probability, we would see that prices do support a project, but it's a huge investment."

"So even a slight risk of lower prices is a problem, is what you're saying, I think," said Rep. Tom Allen, D-Maine.

"That would be my assessment in terms of the market," Carruthers said. "Ultimately, it really is the resource owners' issue in terms of pricing."

Konrad said that passage of the "fiscal provisions considered in the Senate" was one necessary step to convince BP to spend an estimated \$1 billion on designing and obtaining permits for the line.

Carruthers, though, pitched a smaller, \$13 billion proposal to the committee. Enbridge's proposal would start with a 36-inch line instead of the 52-inch line, which could cut initial costs and speed up completion time by a year, he said. Such pipe could also be manufactured in the United States.

Konrad said the smaller pipe could thwart efforts to provide the lowest-cost gas. The smaller pipe would mean a higher transportation charge, or tariff, on the gas, he said.

"The whole goal is to get it to the consumer at the lowest tariff and we think the large-diameter line does that most effectively," Konrad said.

Rep. Ted Strickland, D-Ohio, said political realities might favor the smaller pipe.

"To have the opportunity for American steel companies to be a vital participant in production of materials for this pipeline could go a long way toward really causing an excitement among many of us," he said. "I understand that is an esoteric, some even might say narrow or self-interested, point of view, but it's one that I think, to me and many others, could be very important."

Dennis McConaghy, executive vice president of TransCanada Corp., said he thought American steel mills could produce a 48-inch pipe. TransCanada also is seeking to build the Alaska line and already holds government construction permits approved in the 1970s. □

# Submarine Operations at the North Pole

by Billy-Ace Baker

Enthusiasm for artifacts of polar exploration reached a new level last year (18 June 2003) when a souvenir envelope—known as a “cover” in philatelic circles—carried to the North Pole by the submarine *USS Nautilus* in 1958 hit a record price on eBay, the Internet auction house. Swept up in a wave of competitive exuberance, two collectors pushed the addressed cover from its \$199 opening bid to a high bid of \$820.

Normally *Nautilus* North Pole covers sell for \$350 to \$400. The cover is one of 1,570 that were serviced aboard the nuclear powered submarine that made history in the summer of 1958.

The *Nautilus* sailed from the Submarine Base at Pearl Harbor, Hawaii, on 22 July and subsequently found a passage north of Point Barrow; traveling submerged under the pack ice, it reached the North Pole on 3 August.

To commemorate this historic event, members of the crew held a competition onboard the *Nautilus* to design both the cancellation device and the cachet, which would be applied to the envelopes to memorialize the event. The canceling device was carved from a block of linoleum.

The auctioned airmail envelope bears the printed return address of the United States Navy Electronics Laboratory in San Diego and is addressed to a woman in Los Angeles.

According to *Lynn's Stamp News*, a retired nuclear submarine commander and a prominent collector of submarine covers said that there is nothing particularly unique about the cover—nice strike and good cachet, but otherwise ordinary.

What this collector and possibly the winner of the auction failed to realize is that the cover has a significant connection to, and seems to have been initiated by, the “father” of under-ice submarine operations. Although it is hard to see and partially obscured, the name “W.K. LYON” is handwritten in the printed return address portion of the envelope, and Dr. Lyon was aboard the *Nautilus* during the historic event.

Dr. Lyon was head of the Navy Electronics Laboratory, the Arctic Submarine Laboratory and, later, the Navy Arctic Research Laboratory, for over 50 years. Lyon and his team of scientists and technicians designed and built the instruments that made the *Nautilus* trip and other such voyages possible.

Lyon was personally involved in testing the equipment and theories aboard diesel and nuclear submarines. Today, thanks to Lyon and his staff, nuclear submarines are able to operate under the Arctic icepack on an almost routine basis.

During WWII, German U-boats in the Gulf of St. Lawrence were undetectable, because sonar failed under

the surface ice. Dr. Lyon addressed this problem by designing and testing sonar and oceanographic equipment for the submarine *USS Boarfish* and participating in the ship's first under-ice dives.

In 1946 Lyon received a letter from the office of the Chief of Naval Operations, inquiring if there was any research he wanted to do in conjunction with Operation Highjump. Lyon suggested taking a submarine on the expedition into the cold Antarctic waters to test under-ice sound transmission and cold-water oceanographic work. His proposal was accepted and, as a result, the *USS Sennet* became part of the Operation Highjump Ross Sea Central Group.

Lyon deployed aboard the *USS Merrick* at Port Hueneme, Calif., and upon reaching Antarctica, Lyon was transferred to the *Sennet* on 31 December 1946. After becoming beset in the ice several times, and due to ever increasing difficulties in maneuvering in the ice, the Task Force Commander, Admiral Cruzen, ordered the *USCGC Northwind* to escort *Sennet* to the vicinity of Scott Island. There, *Sennet* conducted sonar surveys and oceanographic work both on the surface and submerged, but did not go under the ice. The *Sennet* also provided weather reporting and picket duties for aircraft from the *USS Currituck*. Having completed his mission, Dr. Lyon transferred to the *USS Philippine Sea* around 23 January.

On 4 February 1947, *Sennet* out-chopped from Operation Highjump and was under way for Wellington, New Zealand. Although *Sennet* was redeployed early, the recommendations that Dr. Lyon made initiated an effort that would last over four decades.

Dr. Lyon retired in 1992 after a long and illustrious career of 55 years. Following his death in 1998 at the age of 84, the nuclear submarine *USS Hawkbill* carried his ashes to the North Pole for burial at sea.

Whether he knows it or not, the winner of the auction, who is a New Zealand resident, bought a unique cover of great historical significance. The connection to Lyon justifies the price paid.

Commander William B. Anderson, the commanding officer of the *Nautilus* during the historic voyage, was airlifted off the submarine near Iceland and flown to Washington, D.C., where he met President Eisenhower. There, in a ceremony at the White House, he was presented with the Legion of Merit and a Presidential Unit Citation for the ship and crew. Anderson was then flown to England and rejoined the *Nautilus* as she entered Portland harbor. Although Anderson was the man of the hour, Lyon—who was actually responsible for the event—was later awarded the Civilian Meritorious Service Award by President Eisenhower. □



Overheard, one polar bear to another: “There goes the neighborhood!” Shot from the *USS Honolulu* (Los Angeles-class fast-attack submarine) at the Arctic Circle, 280 miles from the North Pole. (PHOTOGRAPHER UNKNOWN)

# Wilderness Research Foundation Aims For The High Arctic

by Sheldon Bart

In December of 1929, Dr. Larry Gould of the University of Michigan, chief scientist of the First Byrd Antarctic Expedition, 1928-30, discovered a rock laced with seams of coal, the kind of rock, he said, that he "had come all the way to the Antarctic to find." That rock enabled him to understand the process of formation of the Transantarctic Mountains. It enabled him to connect the snow-capped peak he was standing on to a peak hundreds of miles away where a similar rock had been found. Since he understood that coal is formed by decomposed plant life, he could also connect that rock to an earlier geological era when Antarctica was warm and lush. This was the beginning of the modern recognition of climate change.

In addition to Gould, a geologist, the science staff of the Byrd expedition consisted of two meteorologists, a physicist, biologist and oceanographer, as well as a staff physician from Johns Hopkins University who participated in biological research projects. The expedition was supported by private contributions. Admiral Byrd conceived the project, recruited the personnel, raised the money and exercised command.

Byrd repeated the performance in 1933-34. The U.S. Government entered the picture later in the decade, financing the Antarctic Service Expedition, 1939-41, mounted under Byrd's leadership. Today, government institutions are the primary sponsors of scientific exploration. However, only about 19 percent of the applicants to the National Science Foundation are actually funded each year. The percentage of applicants funded by the National Geographic Society, a quasi-governmental agency, is even smaller, about 11 percent. This means that the geologist, physicist and biologist who, in an earlier era, would have been grouped together on a Byrd expedition, must now compete with each other for the scarce research dollar.

Wilderness Research Foundation was brought into being to address this situation. Our purpose is to do, as a not-for-profit organization, what Richard Byrd, Roy Chapman Andrews and other explorers of the 1920s and '30s did as individuals—to raise money in the private sector to mount scientific expeditions. Our initial project is an expedition to Axel Heiberg Island in the High Arctic. Samples of ice recovered from deep in the Greenland and Antarctic ice caps in recent years have revealed a fluctuating climate swinging abruptly back and forth between warming and cooling periods. These studies have provided an "outline" of the history of climate change on earth over the past 100,000 years. The "story" of the impact of abrupt climate change on living organisms and complex ecological systems remains to be fleshed out.

Drilling for and analyzing the high-resolution climate record is a well-funded activity sponsored by national and international research programs.

Unearthing and interpreting the ramifications of rapid climate change is an interdisciplinary

area that is not currently well-supported by governments.

This is where we come in.

Wilderness Research Foundation grew out of the 1996 American Expedition to Baffin Island, a modest geographical survey which I organized and led, and which would not have gotten off the ground without the advice and counsel of Capt. Brian Shoemaker, then serving as Secretary of the American Polar Society. The Board of Directors of Wilderness Research Foundation consists of a small group of volunteers based in and around New York. They include Charles O. Cowing, Chairman of the Elisha Kent Kane Historical Society; Dr. Raymond Sambrotto, a research scientist at Lamont-Doherty Earth Observatory of Columbia University; Carl G. Schuster, a Fellow of the Explorers Club; and Leslie Trager, our attorney. Ray Sambrotto has crossed the Arctic and Antarctic Circles on icebreakers and nuclear submarines, studying the biological productivity of the polar seas. Carl Schuster has led or participated in eight expeditions to Arctic and subArctic Canada, and is a specialist on the early mapping of the region.

*The Eureka Sound Formation has yielded remains of ancient animals, as well quadrupeds resembling primates.*

Our scientific Advisory Board, at this juncture, consists of Dr. John England of the Department of Earth and Atmospheric Sciences of the University of Alberta; Dr. Malcolm McKenna, Curator Emeritus of the American Museum of Natural History; Dr. Mark A. Norell, Chairman of the Department of Vertebrate Paleontology of the American Museum; and Dr. Neil H. Shubin, Chairman of the Department of Organismal Biology and Anatomy of the University of Chicago.

Mark Norell and Neil Shubin recommended Axel Heiberg Island as the focus of our first expedition, and Neil blocked out a number of locations along the southern coast where he felt field research could usefully be undertaken. Axel Heiberg is a rugged sprawl of badlands resembling the barren, desolate cliffs and canyons of the American southwest transplanted 700 miles above the Arctic Circle and capped with glaciers. This is the High Arctic, as far north as you can go in the Western Hemisphere and still remain on dry land. The snow melts in June, and the land is exposed during a brief summer that can last perhaps from four to six weeks. John England, the distinguished recipient of the Northern Research Chair of the National Sciences and Engineering Research Council of Canada, described the island to me, as it appears in July, beneath the midnight sun, as an untouched "Eden" of sand, streams and gravel. Other folks

have called it "Mars on earth."

A much warmer and more moderate environment existed in the region in earlier geological eras. The Arctic islands once abounded with vegetation and a multitude of animal life. Petrified tree stumps have consequently been found in recent decades in northern Axel Heiberg. The Eureka Sound Formation, an area extending from eastern Axel Heiberg to western Ellesmere, has yielded the fossilized remains of ancient rodent-, bear- and rhinoceros-like animals, as well as very early quadrupeds resembling primates. Large crocodile-like reptiles were unearthed in western Axel Heiberg. Archaeological sites on eastern Axel Heiberg have disclosed evidence of human occupation.

A number of American and Canadian researchers have contacted us expressing interest in probing the mysteries of the soil, rocks, ice and streams of southern Axel Heiberg. One has developed state-of-the-art techniques for reconstructing climate changes through the analysis of microscopic material in lake sediments. Another proposes to core for samples of ancient organic carbon to illuminate the cycle by which carbon becomes concentrated in the ground when glaciers advance and diffuses into the atmosphere when glaciers recede. Others are looking at vegetation change and snow-cover change in relation to climate change and the evolutionary response of early animal communities to a changing climate.

It would take \$355,000 to put these people in the field and get them back safely, taking into account various emergency scenarios. My colleagues and I are working assiduously to raise this sum. We meet alternately at the Explorers Club on Manhattan's Upper East Side or in the Kane-Peary-Byrd Room, a spacious gallery on the sixth floor of a building near Madison Square Garden.

Thus far we've received positive feedback and expressions of interest from the Henry Luce, Kane Lodge and Drachon Foundations, the National Council on Science and the Environment, the Consultative Group on Biodiversity and the Wildlife Conservation Society.

We would be pleased to hear from scientists interested in participating in future expeditions to other Arctic locations (or any wilderness area where field research may be productive) and from anyone who may be in a position to help advance our cause. Larry Gould didn't know what he would find in Antarctica when he departed with Admiral Byrd in the fall of 1928. Similarly, any one of our researchers may make a discovery that could change the course of our understanding of the mechanisms of climate change. Perhaps one can only say that out on a cold and desolate mesa on our itinerary, where the wind howls under the midnight sun, something of tremendous significance for science and humanity may be awaiting discovery. □  
**Sheldon Bart, President of Wilderness Research Foundation, can be reached at WildResch@aol.com and 212-592-4047.**

## The Last Giant of Beringia: The Mystery of the Bering Land Bridge

reviewed by Dave Norton, Arctic Editor

**T**he *Polar Times*' Summer 2003 issue carried a preview of *The Last Giant of Beringia: The Mystery of the Bering Land Bridge* (Westview Press. Clothbound \$26.00) before author Dan O'Neill had found a publisher. Happily, this chronicle of Dave Hopkins' career-long devotion to solving the geological puzzle of the connections between Asia and northern North America is becoming available at the same time as this issue of *The Polar Times*.

Since last year's preview, however, the author had to adjust to the realities of what O'Neill calls "New York-centric" book marketing. My first encounter with the book was to read a neatly bound typeset manuscript in February 2004. Its cover illustration immediately appealed to me. It featured three field scientists trudging along, deep in thought while inspecting grassland hummocks surrounding them. Brilliant sunlit cumulus clouds formed the backdrop. That 1948 photograph, taken by Hopkins himself on the Seward Peninsula of Alaska (Fig. 1), fitted perfectly with O'Neill's narrative. It corresponded to contested ideas within scientific debates that lasted for half a century regarding the kind of vegetation that had covered the subcontinent of "Beringia" during glacial maxima of the Pleistocene.

mals such as woolly mammoths, steppe bison and saiga antelope. Beringia's uniqueness as an intermittent subcontinent was at stake in this debate. The Bering Land bridge concept evolved into the search for evidence of ecosystems characteristic of this subcontinent. Beringia harboured one set of ecosystems when it was an extension of Asia, but another set of ecosystems took over when sea levels rose and divided Beringia into two smaller remnants, one Asian and the other North American. The chess pieces in this debate were awe-inspiring: continental ice sheets, rising and falling sea levels, fossil sea shells, fossil records of terrestrial mammals, pollen records from lake sediment cores and plant communities preserved in volcanic ash layers.

As O'Neill already knew from his first book, *The Firecracker Boys*, few authors at commercial publishing houses have much say in the choice of title or cover illustration. Publishers consider the title and jacket design as marketing instruments and jealously guard their prerogatives. O'Neill had wanted a picture of Hopkins on the cover, and a clear reference to

"...it sure plays hell with my effort to earn credibility with scientists."

him in the subtitle. That was ruled out because an axiom of publishing holds that "biographies don't sell." He was delighted, however, with the first cover design featuring the 1948 black-and-white photo taken by Hopkins. The artist rendered it in a sepia tone. O'Neill thought it was pertinent, dignified and attractive.

But when the editorial staff presented the cover to the marketing people in New York, it was rejected as not looking Alaskan enough (i.e., not COLD enough). The marketing mavens wanted snow and ice and cool blue tones. In other words, they wanted the cliché, or the clip art image of Alaska.

Soon a new blue-toned cover was designed depicting a towering iceberg floating offshore from snow-covered, jagged mountains. It didn't matter that such bergs are calved from the face of tidewater glaciers, and there were none in this part of the world. It didn't matter that the book was about the LAND bridge, not the waterway. And it didn't matter that there are no such peaky mountains near Bering Strait. The photo may even have been taken in Antarctica—that is, at the opposite end of the earth. An added superimposed map of the land bridge was fine, except that the map was displayed in two parts with the southern portion (Kamchatka and the Aleutian Chain) appearing above, or north of the Alaska mainland!

O'Neill pointed all this out to his editor, saying that the book's core audience would know the difference, even if the general public did

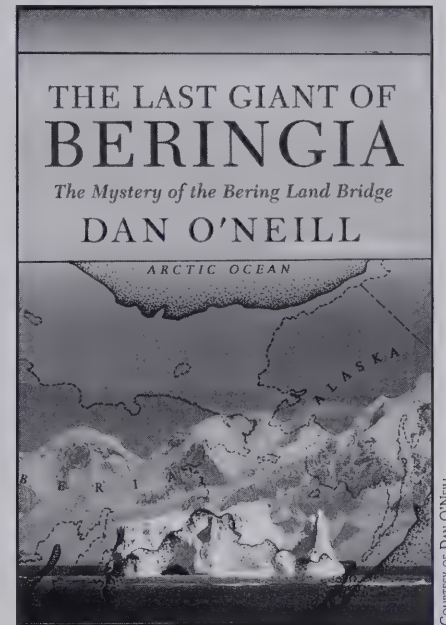


Fig. 2: Final cover design for Dan O'Neill's book on Dave Hopkins' contributions to the geological history of Beringia

not. "I told them, look, if you were doing a book about Manhattan, you'd never dream of putting a picture of the Chicago skyline on the cover. New Yorkers would be insulted. Shouldn't Eskimos feel the same way?" The editor agreed, but (and this says something about the hierarchy in publishing houses) the marketers prevailed.

After several rounds of objections, the map is fixed, but the Antarctic image remains (Fig. 2). O'Neill did manage to get pictures of Hopkins on the jacket's back panel. "The mistake the publisher made," says O'Neill, "is in thinking that to appeal to the masses you have to dumb-down your work. It's not true. And when that much power is given to a twenty- or thirty-something marketing person in New York—who may know nothing about Alaska and less about Bering Strait—well, it sure plays hell with my effort to earn credibility with scientists."

Readers of *The Polar Times* now know the inside story about the outside of this book. You also can use this story as a good conversation-starter, after which the book itself merits a deeper look inside, and your story-telling will be further enriched.

*The Last Giant of Beringia* was many years in preparation. Its success is uniquely to distill the chronology of major contributions across scientific disciplines and to clarify key pivot points in the earth's climatic and biological history. This distillation properly features Dave Hopkins, the "Last Giant," and how he inspired so many other scientists to participate in solving one of Earth's great mysteries. □

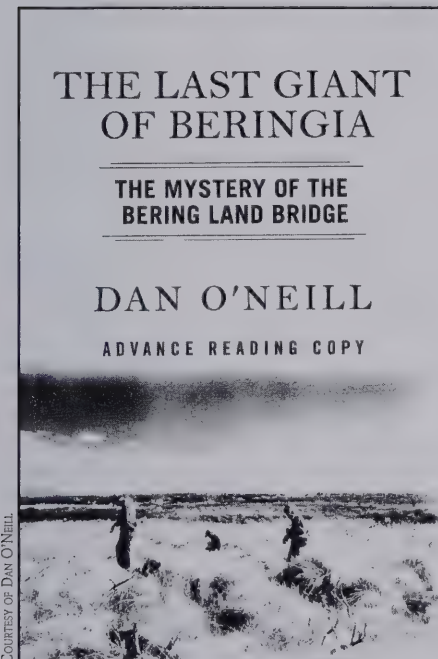


Fig. 1: The cover of the preprint—Seward Peninsula, Alaska, 1948

Some scientists contended that a grass-dominated steppe vegetation supported abundant herds of large mammals. Others cited pollen evidence from lake cores to reconstruct a less productive tundra plant community that could not have supported large resident herbivorous mam-

# Searching For 'Ultima Thule': Part One of Three

## In Greenland's National Park

by Peter Skafte, Ph.D.

"Do you see anything special about this stone?" the Ambassador asked me. "No, I don't know much about geology," I replied.

"It's not the stone's composition but where it is from that makes it special," he said with a smile. "This stone is from Cape Morris Jessup in Greenland, the northernmost point of land on earth."

"Twenty-three centuries ago," he continued, "the Greek explorer Phitheus (Pytheas) was the first to claim he had discovered the northernmost land. He called this northernmost land Ultima Thule, but the record of his journey was lost. Scholars could only speculate that Phitheus may have sailed as far north as Iceland or Norway. The location of our planet's northernmost land was not considered settled until Robert E. Peary discovered Cape Morris Jessup in 1900."

The small stone had a place of honor on a bookshelf in Ebbe Munck's study in Bangkok. Ebbe Munck was at that time, in 1961, the Danish Ambassador to Thailand. He was also known as a hero of the Great War and one of the last Arctic explorers.

It is strange how some ordinary event like this can stick in one's mind like a popular tune that will not let go. As time went by, I never forgot that stone. Somehow, I knew that one day I would have to go find my own.

Twenty years later, I learned that Cape Morris Jessup had lost its claim to being Ultima Thule. A Danish surveying team from the Geodetic Institute in Copenhagen had established in 1978 that a part of Kaffeklubben Island, situated 35 miles to the east of Cape Morris Jessup, was even farther north. But within a few years, Uffe Pedersen, while working on

Kaffeklubben as one of the Danish surveyors, spotted a new island in the sea ice farther to the north. The island was visited by helicopter and named Oodaag after one of Peary's Inuit companions to the North Pole.

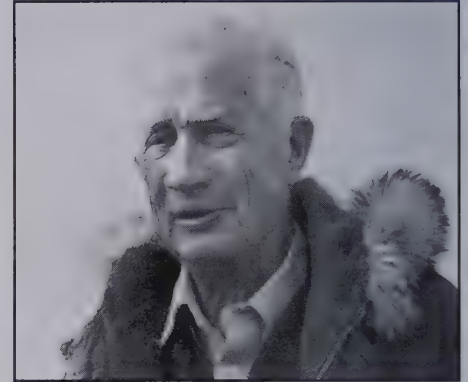
In light of this discovery, I decided the time had come for me to visit Oodaag Island. But I never imagined the obstacles I would have to overcome. For starters, the entire northeastern section of Greenland, the size of Texas and Oklahoma combined, had become the world's biggest national park with restricted access. Only scientists who passed scrutiny by a government committee were granted the necessary permits. In addition, permits for the northernmost area, called Pearyland, could not be obtained without the consent of the eccentric Count Egil Knuth (Fig. 1). Knuth was a learned man, a writer, an artist and an archaeologist who had explored the northeast coast of Greenland with Ebbe Munck before the Second World War. Even in his 90s he flew to Pearyland every summer and conducted archaeological research on prehistoric peoples who had once lived

*As time went by, I never forgot that stone. Somehow, I knew that one day I would have to go find my own.*

in the area. The Count explained in his small booklet, *Independence*, that each campsite he had set up in the High Arctic had been his castle. He wrote:

"At the end of your journey you will look back at the fifty-odd castles you have owned, all equally precious, equally distinctive and all yours and yours alone. No one else has seen them; no others know their secrets. Unite their lands and you own the entire country."

The case for Egil Knuth's "ownership" of Peary Land was not entirely solipsistic. He had political influence, and he and his assistant were usually the only people to



COURTESY OF PETER SKAFTE

**Fig. 1: Count Egil Knuth, one of the last arctic explorers. He was a controversial figure. Some people believe he had too much influence over who was allowed to visit the northernmost region of Greenland.**

visit the area during the summer. I repeatedly asked him if I could join him on one of his trips. He said, "Maybe," but nothing ever came of it. I realized that if I was ever to see Oodaag Island I had to be patient and learn more about the National Park and how it was managed. As a first step I joined a French expedition in 1985, led by the biologist Christian Kempf (Fig. 2), to the southern end of the National Park.

Our group flew into Mestersvig, situated near the entrance of the enormous Kong Oscar Fjord. Here, a handful of Danes maintained a landing strip during the summer. Henry Hudson had made the first recorded sighting of this part of eastern Greenland in 1607. He noted, "For aught that we could see, it is like to be a good land, and worth the seeing." I was not disappointed.

Our first day in Mestersvig was spent packing and launching two Zodiac rafts with outboard motors. Strong winds prevented us from setting off until seven o'clock in the evening. Even then it did not look safe. Icebergs and drift ice had blocked the entrance to the fjord. The first five hours we putted around and around in a labyrinth of small channels amongst the ice. Having brought a wetsuit, I was able to stand in water on the ice floes and pull the rafts through the narrowest spots. Once we had passed the drift ice, our progress was rapid, but the constant slamming of the raft against the waves would jar me to the point of agony. We camped 60 miles later on the shores of Ymers Island.

The following day, Christian Kempf and I sailed a few miles to the small Ella Island, which is located near the end of Kong Oscar Fjord. We needed to pick up a couple of barrels of gasoline that had been stored on the island. As we stepped ashore, I was startled to see a lone figure walking toward us.

"I am Claus Birkbol. You fellows look cold. Would you like some lunch with me and my partner?" We realized we were talking to a member



COURTESY OF PETER SKAFTE

**Fig. 2: French expedition members at old trappers hut in Rendalen near the shores of Isfjord. (I am not in the picture. Christian Kempf is seen standing with a big beard on right.)**



Fig. 3



Fig. 4

**Two views of Teufelsschloss, or Devil's Castle, a giant stratified monolith standing along Kaiser Franz Josephs Fjord, as depicted in a 19<sup>th</sup> century German painting (Fig. 3) and by modern photography (Fig. 4).**

of the Sled Patrol Sirius, a Small Danish military unit which carries out one of the loneliest and most arduous jobs on our planet. During the colder months, 12 men patrol the entire coastline of northeast Greenland by dog sled. Traveling in teams of two, the men ski while their dogs pull a 1000-pound sled laden with provisions and equipment. Claus and his partner were making repairs to the roof of two small houses built on Ella Island for the Danish Lauge Koch expedition in 1931. Now the place is used by the military. Claus was probably the most experienced member of the sled patrol. He had already served four years and 13 summers in the National Park. While Christian and I sipped on our coffee, we were entertained with wonderful tales of encounters with polar bears and Arctic blizzards.

After lunch we went back to our camp to pick up our other group members for a journey into the bottom of Ice Fjord, fifty miles to the west. Those familiar with the Arctic have come to expect vast expanses and dramatic mountain ranges. But nothing prepares one for the beauty of this section of Greenland's national park. From the time of the earliest explorers, witnesses have struggled to find worthy superlatives for their experiences. Lieutenant Julius Payer, a member of the German expedition in 1870, gave the following description:

"We had entered a basin, the shores of which were formed by rocks, which for glorious form and color I have never seen equaled. Here were congregated all the peculiarities of the alpine

world: Huge walls, deep erosion fissures, wild peaks, mighty crevassed glaciers, raging torrents and waterfalls.... A colossal cubic rock on a small base of a cubic tongue of land stretched itself far into the fjord, rising out of the blue water to a height of 5,600 feet; regular reddish-yellow, black and light stripes, showing the different layers of the stone. The terraces and towers on its edges resembled a ruined castle: we therefore called it the Devil's Castle." (See Fig. 3 and Fig. 4 for comparisons of 19<sup>th</sup> and 20<sup>th</sup> century views of Teufelsschloss, or Devil's Castle.)

Had Lieutenant Payer traveled farther into the fjord system he would have found something that even surpassed the Devils Castle in size.

This is the giant cliff called Attestupan; named by the Swedish explorer A. G. Nathorst in 1899 after a Viking legend. Attestupan was a cliff where a Viking suffering from old age could jump to his death in order to be more readily accepted into the Norse heaven.

When I suggested to my other expedition members that we take a look at Attestupan, they were hesitant.

But their reluctance was replaced with reverential awe as we sailed toward this giant. They did not expect to encounter a 6,300-foot cliff rising out of the fjord. Five Empire State Buildings balanced on top of each other would form a tower of equal height. It was bathed in a strange golden light that seemed to emanate from within. In the back of the Zodiac raft, I heard someone's hushed voice recite a line from Baudelaire, "*Tu stillonnes gaiment l'immensité profonde.*" (You plunge joyfully into deep immensity). And the voice was right. Suspended between the swaying cliff above and its perfect reflection in the water below, I felt we could fall upwards along the cliff into the sky.

Weeks later, when we camped at Mybugta our leader Christian Kempf decided that one Zodiac raft (Fig. 5) would sail to Daneborg, which is the headquarters of the Sled Patrol Sirius. I volunteered at once. The men at Daneborg had to know more about Oodaag Island than anyone else. One sled team would visit the area each year on a long trek

north around Greenland.

After eleven hours of slamming against icy waves, dripping wet and shaking with cold, we reached the beach at Daneborg. We had crossed 74° North latitude, as far north as we aimed for on this trip. A Sirius Patrol member met us on the beach and escorted us to Commander Gulbrandsen in the mess hall. "Don't mind 'Guli,' he can be a little gruff, but he is a really nice guy," our escort had informed me. Soon the Commander was interrogating us. During the interview I leaned against a table from fatigue. "Don't you know how to stand up

straight?" Gulbrandsen growled.

"Yes sir." I jumped up and stood at attention. In spite of his gruffness, "Guli" was in fact a friendly and helpful person, and he answered

many of my questions about the land to the north. When I mentioned that I would like to visit the newly discovered Oodaag Island, he looked surprised and said, "I don't understand why you want to go there. In the winter the island is buried under ice and snow, and during the summer it is just a small gravel bar. You would also have great difficulty in obtaining a permit for an expedition to Peary Land." Listening to Gulbrandsen, I realized that my hope of reaching the northernmost point of land was little more than a pipedream. I returned from Greenland with a heavy heart, not realizing that my luck was destined to change. □ Dr. Peter Skafte is a Danish anthropologist who is the Executive Director of Folk Traditions Conservancy. He currently lives in Santa Barbara, California.

**Editor's Note:** Dr. Skafte's story will continue with Part Two in the Fall-Winter 2004 issue of The Polar Times.



**Fig. 5: Zodiac raft in Isfjord (Ice Fjord). This mode of travel is not without risks. The French expedition leader did not believe in life jackets. "With or without life jackets a person dies after a couple of minutes in the water," he said.**

## Weather in New York 2004

Weather got a tad chilly in the Big Apple in January this year, and *New York Times* columnist Peter Edidin decided to put things in perspective with some cold weather accounts of places remote and years past. You may recognize some of these excerpts.

**From "The Worst Journey in the World: Antarctica 1910-1913" (1922), by Apsley Cherry-Garrard, a member of the Scott expedition, who nearly died searching for emperor penguin eggs to bring back to Britain:**

It was the darkness that did it. I don't believe -70-degree temperatures would be bad in daylight, not comparatively bad, when you could see where you were going, where you were sleeping, where the sledge straps were, the cooker, the primus, the food; could see your footsteps lately trodden deep into the soft snow that you might find your way back to the rest of your load.

But in these days were never less than four hours from the moment when Bill cried "Time to get up" to the time when we got into our harness. It took two men to get one man into his harness, and was all they could do, for the canvas was frozen and our clothes were frozen until sometimes not even two men could bend them into the required shape.

**From "Alone" (1938), by Richard E. Byrd, who wintered by himself in Antarctica:**

July 7—Everything - myself included - is saturated with cold. For two solid weeks the red thermograph trace has been wandering through the minus 40's, 50's, and 60's. A moment ago, when

I turned the flashlight on the inside thermograph, the pen was edging past -65 degrees. The ice over the skylight is fanning out to meet the ice on the walls, which has risen level with my eyes. I hope fervently that the cold will let up, for I simply must have more warmth, even at the expense of less ventilation and more fumes.

I am still in wretched condition. My brain seems unspeakably tired and confused. Last night was agony. This morning was one of my worst. The gloom, the cold, and the evenness of the Barrier are a drag on the spirits; my poise and equanimity are almost gone.

**From "Rachel Calof's Story" (1936), recollections of a homesteader in North Dakota in 1894:**

At this time the in-laws had a flock of 12 chicken and Abe and I also had 12. There was no outside coop for the poultry, but if there had been, we would have lost the flock in short order because the temperature would soon be going to 40 or more degrees below zero and chickens would have frozen to death. We needed to keep them alive in hopes of having their eggs as well as their meat later on. Each family was to keep its chickens under its bed and the ends and sides were closed off to form a cage. Also, there was a calf which had to be accommodated inside. It occupied the remaining corner....

This is how 5 human beings and 25 animals faced the beginning of the savage winter on the plains in a 12-by-14-foot shack. This was how we lived and suffered. The chickens were gen-

erous with their perfumes and we withstood this, but the stench of the calf tethered in the corner was well-nigh intolerable.

**From "Siberia: The New Frontier" (1969), by George St. George:**

In January and February, temperature readings of -70 degrees are not uncommon through Yakutia, causing human breath to freeze instantly with a crackling noise which is locally known as "the whispering of the stars" - a poetic name, but a highly uncomfortable phenomenon. In fact, on frosty days all Yakutian towns are enveloped in a man-made fog caused by the exhalations of men and animals, a weird phenomenon not found anywhere else.

**From "This Cold Heaven: Seven Seasons in Greenland" (2001), by Gretel Ehrlich**

Greenlanders say that only the *qanuallit*—the white people—are afraid of the dark, while Eskimos like nothing better than long winter days of storytelling and talking to spirits. Rasmussen told the story of two Danes—Gustav and Olaf—who overwintered together every year on the east coast of Greenland, where they hunted foxes and sold the skins in the spring. Olaf made dinner one night. Later, Gustav said he had a bad stomachache. Shortly after, he died sitting in his chair. In Olaf's grief and the shock of utter solitude, he found he could not part with his friend. He set Gustav's corpse, still in the chair, outside to freeze and in the evenings brought him back inside, seating him at the dinner table so he would not have to eat alone. In the spring, when Gustav began to thaw, Olaf took him home to Denmark to be buried. □

## Fifty Years Ago

Fifty years ago, Canada and the U.S. began construction of the Dew Line.

At the time, and even today in the Arctic, this would be one of the most ambitious construction projects ever undertaken. The Distant Early Warning, or DEW, Line was a series of radar early warning stations running roughly along the 69<sup>th</sup> parallel from Alaska to Greenland. Under the most difficult conditions imaginable, some 460,000 tons of material would be shipped and airlifted 200 miles north of the Arctic Circle where construction crews—primarily civilians—worked 24/7 erecting prefabricated modular buildings 28 feet long, 16 feet wide and 10 feet high. These units were joined together in "trains," some as long as 400 feet. Overhead bridges connected parallel trains and nearby on steel towers were mounted the distinctive DEW Line Geodesic domes containing the long range and low level detection radars and associated electronic and communications equipment.

Stations had relatively low manning requirements because MIT's Lincoln Laboratory had developed an automated alarm that alerted station personnel when the radar acquired targets. This meant that operators did not have to man radar scopes around the clock. Even so, a typical site would have 13 to 15 personnel who stood duty 12 hours on and 12 off, seven days a week, for

three months. The sun failed to rise for two months of the year along the DEW Line, and temperatures of 65°F to 70°F below zero were not uncommon. It was rough and lonely duty in the barren Arctic, but the pay and chow—one or both—must have been good, as many men repeatedly re-upped for site duty.

DEW Line construction was completed in 1957, and this radar shield afforded the U.S. and Canada three to five hours of early warning should the Soviets attempt to launch a nuclear attack by long-range bombers. This threat receded in the mid 60s, as the Soviets developed ICBMs, which were unlikely to be detected by DEW Line radar that could only reach targets below 65,000 feet. In 1980, Air Defense Command was inactivated and, in 1980, the DEW Line was downgraded and called the North Warning System. Thereafter, many sites were scrapped, and others were fitted with automated equipment with manning levels further reduced. Today the remaining DEW stations are rusting and abandoned, with some presenting environmental problems from PVC and other residual toxins that were normal to a site decades ago. Start to finish, including its years of operation, the DEW line is estimated to have cost \$7 billion in today's dollar. □ **Cliff Bekkedahl, Editor, The Polar Times**

## 'The Polar Times' Indexing Project

by John Splettstoesser, APS President

APS member Charles Lagerbom, who teaches archaeology and history at Belfast Area High School, Belfast, Maine, and is a Research Associate in the History Department at the University of Maine-Orono, is further indexing *The Polar Times* to supplement the indexing that was done in the past.

With the combination of copies provided by Lynn Lay, librarian at the Byrd Polar Research Center, and Brian Shoemaker, it is hoped that all printed issues, plus their indices, will be bound and made available for scholars at the polar archives section in The Ohio State University library.

As of this notice, several issues are available in only Xerox form—numbers 17, 23 and Vol. 2, No. 1. (Numbers 26-39 were never published by APS founder August Howard.)

If members find that they possess the three mentioned issues and would like to donate them to the project, please let Charles or *The Polar Times* editors know so that originals rather than copies can be bound along with the indices.

Charles, no newcomer to the subject of polar literature, wrote *The Fifth Man: The Life of H.R. Bowers* (1999). □

# APS Member Receives Patent for Iceberg Utilization Process

Jack Shick, who some of you may have met at the symposium last October, has been granted a patent by the U.S. Patent Office for improvements he has devised for movement of icebergs from Antarctica to arid destinations for use as fresh water. His process envisions use of kelp grown into mats and used as insulation to maintain the iceberg's integrity as it transits warm waters *en route* to its destination.

The patent addresses all of the technical issues that would be encountered, from iceberg selection to insulation, propulsion and destination facilities. The patent text is a fascinating read and can be pulled up on the Internet at *uspto.gov*; when the website appears, follow search instructions and enter patent number 6688105.

## SOME HIGHLIGHTS:

**Propulsion:** A preferred iceberg would be sized at one mile in length, a half mile wide and 500 feet deep. Initially, the berg would be captured and moved to an insulation site by unmanned electric-powered subs controlled by a surface ship. For the long transits, the insulated berg would be pushed by two subs and steered by another sub. At a speed of one mile per hour, a journey to San Francisco would take 250 days

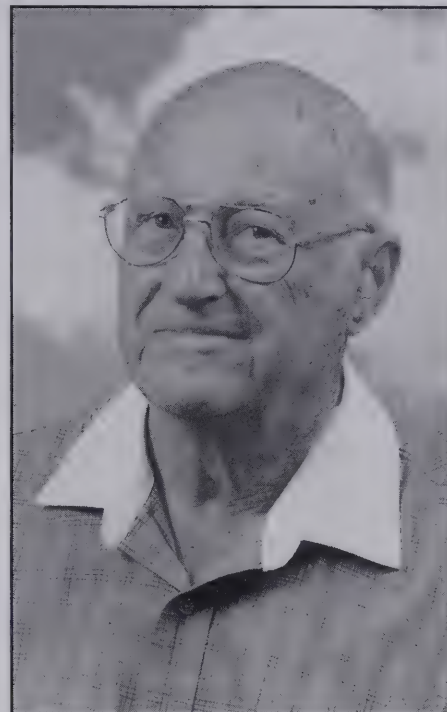
**Insulation:** Grown in prepared fields through

floating nets, kelp would be cut and entangled into mats that would be drawn under and up the sides of the berg to form an insulating envelope, perhaps as thick as three feet. That portion under the berg, 500 feet, would be compressed and frozen. On arrival at the destination the kelp would be salvaged and ground to mulch.

**Delivery and Storage:** As Jack makes clear, this is the heart of the process—a huge facility, starting with a seaward channel capable of handling a berg, a storage basin comprised of roll dams that ultimately exclude sea water and allow for uncontaminated water melt, and the capacity to treat the water and further deliver as needed.

Obviously, this process would require huge investment but, as the author points out, a World Bank recent report posits that \$600 billion will be spent in the next decade alone to augment water reserves. Much of this money will go to desalinization methods, and this could prove to be a less costly and more abundant source.

Member Jack Shick can be reached at [globalwsjns@aol.com](mailto:globalwsjns@aol.com), and I'm sure he would appreciate constructive comments from fellow members. □



Jack Shick

## Patents on Ice

**Scientific American Online, May 2004, by Gary Stix**—A patent and trademark office has yet to open its doors on McMurdo Sound or at Prydz Bay. But the microbes and fish that live in Antarctica and its environs have already become the subject of patent claims. The Spanish patent office granted a patent in 2002 for wound healing and other treatments with a glycoprotein drawn from the bacterium *Pseudoalteromonas antarctica*. Also that year, Germany handed out a patent for a skin treatment using an extract from the green alga *Prasiola crispa* ssp. *antarctica*. And an application now before the U.S. Patent and Trademark Office covers a process for producing antifreeze peptides discovered in Antarctic bacteria.

In all, it is estimated that more than 40 patents have been granted worldwide that rely on Antarctic flora and fauna, and the U.S. patent office has received in excess of 90 filings. These numbers are not large—and no commercial enterprise is engaged in industrial harvesting of the continent's biota. But drug companies bring in tens of billions of dollars every year from natural compounds or synthetic knockoffs inspired by them. Interest in developing pharmaceuticals from Antarctica's novel life-forms, extremophiles—which withstand cold, aridity and salinity—will continue to grow. A case in point is AMRAD Natural Products, an Australian pharmaceutical company that struck a deal with the Antarctic Cooperative Research Center at the

University of Tasmania in 1995 to screen about 1,000 microbial samples a year for antibiotics and a range of other pharmaceuticals.

One or two blockbuster drugs derived from Antarctic bacteria could spur a veritable stampede. A United Nations study released in February cautioned that the push to exploit extremophiles requires new rules to protect the continent's fragile ecosystem. Regulation of these activities presents special challenges. The

*One or two blockbuster drugs derived from Antarctic bacteria could spur a veritable stampede.*

Antarctic Treaty System pledges to protect the continent's environment but does not address bioprospecting directly, which could encourage more of these endeavors.

Moreover, existing international policies on bioprospecting are of limited use. For instance, although the Convention on Biological Diversity has established a framework for allowing access to biological resources, it assumes that individual states in fact have sovereignty over these resources, a presumption that does not hold for

Antarctica. Moreover, it is already a problem to figure out who is doing the collecting and for what purpose. Bioprospecting often involves consortia composed of public and private entities. Delineating where scientific research ends and commercial activity begins becomes a difficult task, notes a report from the U.N. University Institute of Advanced Studies entitled "The International Regime for Bioprospecting: Existing Policies and Emerging Issues for Antarctica."

The document was drafted in preparation for a biodiversity meeting, the Seventh Conference of Parties to the Convention on Biological Diversity, held in Kuala Lumpur, Malaysia, this past February. The report calls for the development of regulations to govern bioprospecting that would address a series of basic questions: Who owns the continent's genetic resources? How can scientists legitimately acquire biomaterials? What measures should researchers take to protect extremophiles? Who owns the products that eventually get marketed commercially from these discoveries? And would bioprospecting violate a provision of the Antarctic Treaty System requiring that scientific results be shared freely? Determining the answers now might help waylay the legal entanglements that will inevitably occur if bioprospecting thrives and a swarm of extremophile collectors descend on Prydz Bay and other entry points to the frozen continent. □





*Floating  
sculpture  
in Kajser  
Franz  
Josephs  
Fjord*

PHOTO  
COURTESY  
OF PETER  
SKAFTE.

# Due South

By Jeff Rubi *N*, Antarctic Editor



There's a story behind the stories—at least some of them—in this issue of *The Polar Times*. We reprint a series of Antarctic-related stories from the *Times* of London which appeared during the holiday season last year, all for a good cause.

Each year the *Times* chooses two charities as recipients of its annual Christmas Appeal. In 2003, the *Times* chose the humanitarian group CARE International UK, for rebuilding schools in Afghanistan and Iraq, and the Royal Geographical Society.

As part of the Appeal, the *Times* published stories on the two organizations; in the case of the RGS, the articles highlighted several aspects of the society's polar collection.

The RGS is a vast treasure trove of maps, diaries, photographs and items relating to more than 200 years of polar exploration. For decades, however, the society has not had an adequate facility to enable the public to view its treasures properly.

That is finally being remedied with construction of a new public center adjoining the RGS headquarters on Exhibition Road in London. This glass pavilion is currently due to open in early June and will include an education center, exhibition space and reading room.

Thanks to the Appeal, the RGS received

£40,628.92 (approximately \$72,800), says Rebecca Dunford, development officer at the RGS. (The *Times* reported that an additional £170,000 was sent to CARE International UK.)

The Appeal started at the beginning of December 2003 and ran until the end of January 2004. "The donations still kept coming in until mid-March," says Ms. Dunford, "and even now we get the odd one!"

Speaking of giving, there's another polar organization with a deserving fundraising campaign in progress: the Scott Polar Research Institute (SPRI) in Cambridge, England. Founded in 1920 and named for the Antarctic explorer Capt. Robert F. Scott, the Institute is one of the world's leading polar organizations.

Although SPRI is part of the University of Cambridge (a sub-department of the Department of Geography), like many organizations, it's feeling the pinch in these difficult economic times. Or, as the chairman David Wilson (grand-nephew of Capt. Scott's friend, deputy and chief scientist Edward Wilson) wrote recently: "Many years of diminishing finances in the library and archives are biting."

*The RGS is a vast treasure trove of maps, diaries, photographs and items relating to more than 200 years of polar exploration.*

To support SPRI, a Friends group was formed in 1946, but membership has remained stalled at around 500 members for some time. I encourage any APS member who is interested to inquire about membership in the Friends of SPRI. Dues are modest (beginning at £17.50 for overseas membership) and will greatly help an important organization.

In fact, there's a strong and longstanding connection between the American Polar Society and SPRI. As noted in the 1 Feb. 1947 *New*

*Yorker* magazine (article reprinted in this issue of *The Polar Times*) our founder August Howard included in every issue of *The Polar Times* a box urging subscribers to read *Polar Record*, the publication of the Scott Polar Research Institute.

SPRI is also launching another initiative, the "William Mills Library Acquisitions Fund." This is to be an endowment honoring the Keeper of Collections and Librarian at SPRI, William Mills, who died on 8 May 2004. (His latest book, *Exploring Polar Frontiers*, is reviewed in this issue of *The Polar Times*.) Initial goal of the fund is £50,000.

*There's a strong and longstanding connection between the American Polar Society and SPRI.*

Friends of SPRI membership dues and/or contributions to the Mills Fund can be sent (payable to the University of Cambridge) to the Friends Secretary, Scott Polar Research Institute, Lensfield Road, Cambridge, CB2 1ER, U.K.

As a postscript to my previous "Due South" column, "Keep the Huts Real" (Fall-Winter 2003), I'm pleased to report that Nigel Watson, executive director of Antarctic Heritage Trust—New Zealand, has written regarding AHT plans for the Ross Sea historic huts, particularly concerning the use of replicas.

"You will no doubt take much heart from the fact that the AHT has decided to retain replication only as an option as part of the long-term strategy for the preservation of the sites, but not to use it without the specific agreement of the AHT Board following future consultation with the wider Antarctic community," Mr. Watson writes.

"The upshot is that for the foreseeable future we will focus our efforts on the major efforts of physical conservation of the existing structure and artefacts starting with Cape Royds." □

## Why South Pole Explorers Favoured Curries

**The Times (of London), 13 December 2003, by Mark Henderson**—More than 90 years after curries sustained Captain Scott on his ill-fated mission to the South Pole, the ingredients have been identified by scientists.

The culinary secret was a curry powder made from turmeric, cumin, black pepper, Cayenne pepper, fenugreek and coriander, a chemical analysis commissioned by The Times has revealed.

The combination of spices was pinpointed by researchers from the Institute of Food Research in Norwich, who used modern techniques to examine a packet of yellow powder found at the final camp at which Scott, Wilson and Bowers died in 1912. It is today part of the Royal Geographical Society's Polar Archive, which is the focus of the Times Christmas appeal.

Despite the sample's venerable age, Fred Mellon and Adrian Parr were able to detect the chemical signatures of six curry spices that are still common today, using liquid chromatography and mass spectrometry.

Curry was already a popular British dish in 1910 when Scott sailed for Antarctica on the Terra Nova, and he took a supply with him on his trek to the South Pole to season basic rations that consisted mainly of biscuit and pemmican, a mixture of dried beef and fat. The explorers would also have eaten seal and penguin meat hunted locally.

Scott refers to the powder in one of his final diary entries, and blames it in part for his deteriorating physical condition: "Sunday, March 18. To-day, lunch, we are 21 miles from the depot. Ill fortune presses, but better may come . . . My right foot has gone, nearly all the toes—two days

ago I was the proud possessor of best feet.

"These are the steps of my downfall. Like an ass I mixed a small spoonful of curry powder with my melted pemmican—it gave me violent indigestion. I lay awake all night . . ."

Iain Grant, senior medical officer at the British Antarctic Survey, said that despite curry's reputation, it probably played little part in Scott's predicament. "It was probably as much the fat from his pemmican as the curry powder that gave him indigestion," he said.

The tradition of taking curry on polar expeditions is anything but dead. Pen Hadow and Simon Murray, currently trekking to the South Pole in support of the Royal Geographical Society's appeal, have also included it among their rations in a freeze-dried chicken version which they make by adding melted snow. □

# Americans Carving Road to the South Pole

**Associated Press, WELLINGTON, 12 April 2004, by Ray Lilley**—Six Americans have just ended a second year of what looks like an impossible mission—carving out a road to the South Pole.

The 1,020-mile “ice highway” from the coast directly south of New Zealand will enable hundreds of tons of supplies and equipment to be hauled on tractor-pulled sleds across the world’s most inhospitable wilderness to the pole’s Amundsen-Scott Base, a U.S. research station. Currently, cargo planes fly in scientists and supplies during the four-month summer.

Where once there was only ice wilderness, now there is a packed surface 20 feet wide and lined with green flags, winding through huge crevasse fields, snow “swamps” and flat pack ice. After two summers of hard going, the \$20 million South Pole Traverse Project has covered 425 miles, and manager John Wright is convinced it can be completed, though not by next summer as originally hoped.

The completion date is the end of the polar summer in 2006, followed by an international environmental review before it can be used, probably no more than three times a year. In contrast, C-130 cargo planes use ice runways in Antarctica several times a day during the summer. “It is just a matter of time and work,” Wright told *The Associated Press* in an e-mail interview from the U.S.-run McMurdo base on the Antarctic coast.

“Last year it took us three months to go three miles across a crevasse field ... full of dangerous hidden crevasses. This year we were ... ‘breaking trail,’ a long, slow slog in soft snow.” In the “snow swamp,” a 180-mile-wide, six-foot-deep field of powder snow, progress slowed to as little as 10 miles a day for the

three tractors towing accommodation huts and fuel tanks.

Instead of gliding along the surface, tractors and sleds plowed deep into the snow, stuck fast and had to be hauled out by vehicles traveling behind them. Wright said the route’s newly compacted surface will remain solid over the winter and be useable next year, though the road itself will move, as the whole ice shelf is in slow, fluid motion.

From one summer to the next the crevasse field moved about 1,000 feet north and grew about 100 feet longer. “The ice had stretched,” he said. Also, five new crevasses appeared in the

*“Last year it took us three months to go three miles across a crevasse field ...*

road surface during the eight-month winter and had to be filled with snow and ice before the tractors could continue. Crevasse filling is expected to be an annual chore.

The U.S. National Science Foundation is paying for the project. Wright said early studies by U.S. Army cold regions researchers estimated the road eventually will mean a 30-day round trip between coast and pole.

When work stopped in late January, the team was still 270 miles from a vast area known as the Polar Plateau, and a long, flattish run to the South Pole, Wright said.

Alan Hemmings, an Australian environmentalist, said the road “is the greatest single footprint of activity we’ve seen in the Antarctic” and has “the potential for far-reaching im-

pacts.” Apart from the 13,000 tourists who visited Antarctica by sea last year, Antarctica’s scientific community has to cope with ever more adventurous visitors.

In December they signaled their frustration by refusing to refuel the homemade plane of a stranded Australian aviator, accusing him of failing to prepare properly for his polar flight. He finally got fuel from another aviator whose expedition was aborted by bad weather.

Hemmings said tour operators “might want to piggyback on this U.S. route—and the U.S. will be able to do little about that.” Hemmings is senior adviser to the Australian-based Antarctic and Southern Oceans Coalition, an environmental advocacy group.

Commercial operators already take tourists across the frozen land mass to the South Pole by plane. The more robust adventure tourist can get about on skis. “The route may attract other activity ... facilitate greater access,” Hemmings said. “We are beginning to change Antarctica.”

Karl Erb, head of the National Science Foundation’s Antarctic program, said the route is subject to stringent international safeguards. Its “sole goal is to provide an alternative to air-ferrying cargo and scientific personnel to the pole,” he said.

The first person to drive to the South Pole was Sir Edmund Hillary, the Everest conqueror from New Zealand, using a modified farm tractor fitted with tracks. He arrived Jan. 4, 1958, as part of the British Commonwealth Transantarctic Expedition. It took him 81 days, and only 23 gallons of fuel remained in his tanks when his small team reached the pole.

To Wright, of Silverton Colo., Hillary is a hero. “My hat’s off to him,” he said. □

## The Times Cook Brings A Modern Flavour To Capt. Scott’s Recipe

by Jill Dupleix

I didn’t have any pemmican and Sainsbury’s were out of seal and penguin meat, but I managed a decent curry with the aid of a 91-year-old curry powder recipe.

The spices identified in Captain Scott’s powder almost form a basic Madras curry powder, missing only the sweet spices of ginger and cinnamon. The pungent cumin gives it a kick, pepper, chilli and the slightly spicy and sharp fenugreek give it a warming heat, and coriander and turmeric help to harmonise.

Taking curry powder to the Antarctic would have helped to add variety to a diet lacking the natural flavours of fresh meat, fruit and vegetables. But spices do more than pep up the food: some, such as cumin, are traditionally used to ease digestion. Black pepper is said to dry mucus, turmeric is an anti-inflammatory, and coriander seeds have diuretic qualities.

With this recipe based on the original curry powder I have had to stray from the reality of the Antarctic kitchen, adding fresh onion and tomato purée to give the spices something to play with. To cook this curry today, we would start with whole spices and grind them to a powder. It would also be improved by including garlic, ginger and fresh vegetables such as peas, cauliflower and potatoes, by strewing fresh coriander on top, and by serving with warm naan.

I have chosen chicken rather than seal or penguin meat for my Captain Scott’s South Polar Curry, which serves four: 8 chicken pieces, egg thighs, legs, 1 tsp curry powder (see below), 2 tbsp plain flour, 2 tbsp vegetable oil, 1 onion, finely sliced, 500ml boiling water or light chicken stock, 2 tbsp tomato purée, 1 tsp salt, 1 tsp sugar.

Captain Scott’s curry powder: 1 tsp ground coriander, 1 tsp ground cumin, 1 tsp ground fenugreek, 1 tsp turmeric, ? tsp ground black pepper, ? tsp cayenne or paprika. Make the curry powder by combining the spices. Reserve one teaspoonful to mix with flour, and coat the chicken pieces well with spiced flour. Heat oil in a heavy-based frying pan, add onion and fry for a few minutes until soft.

Add a little extra oil and remaining curry powder, stirring well with a wooden spoon until you can smell the spices. Add chicken to pan, and fry until well-coated and golden. Add boiling water or stock to almost cover (add more if necessary), tomato purée, salt and sugar.

Simmer uncovered for 30 minutes, stirring occasionally, until chicken is tender and liquid reduced to a sauce. Taste for spices and salt.

Serve with plenty of rice. □

# Antarctica Yields Two Unknown Dinosaur Species

**National Science Foundation press release, ARLINGTON, Va., 26 Feb 2004—**

Against incredible odds, researchers working in separate sites, thousands of miles apart in Antarctica, have found what they believe are the fossilized remains of two species of dinosaurs previously unknown to science.

One of the two finds—which were made less than a week apart—is an early carnivore that would have lived many millions of years after the other, a plant-eating beast, roamed the Earth. One was found at the sea bottom, the other on a mountaintop.

Working on James Ross Island off the coast of the Antarctic Peninsula, veteran dinosaur hunters Judd Case, James Martin and their research team believe they have found the fossilized bones of an entirely new species of carnivorous dinosaur related to the enormous meat-eating tyrannosaurs and the equally voracious, but smaller and swifter, velociraptors that terrified movie-goers in the film “Jurassic Park.”

Features of the animal’s bones and teeth led the researchers to surmise the animal may represent a population of carnivores that survived in the Antarctic long after they had been succeeded by other predators elsewhere on the globe.

“One of the surprising things is that animals with these more primitive characteristics generally haven’t survived as long elsewhere as they have in Antarctica,” said Case, dean of science and a professor of biology at Saint Mary’s College of California, who discovered the bones. “But, for whatever reason, they were still hanging out on the Antarctic continent.”

Case said the shape of the teeth and features of the feet are characteristic of a group of dinosaurs known as theropods, which includes the tyrannosaurs as well as all other meat-eating dinosaurs. The theropods, or “beast-footed” dinosaurs, make up a large and diverse group of now-extinct animals with the common characteristic of walking on two legs like birds.

Recent research has shown that birds are direct descendants of theropods. The remains include fragments of an upper jaw with teeth, isolated individual teeth and most of the bones from the animal’s lower legs and feet. The creature likely inhabited the area millions of years ago when the climate and terrain were similar to conditions in today’s Pacific Northwest—and radically different than they are today.

Martin, curator of vertebrate paleontology at the South Dakota School of Mines & Technology, said the size and shape of the ends of the lower leg and foot bones indicate that in life the animal was a running dinosaur roughly 1.8 to 2.4 meters (6 to 8 feet) tall.

The excavations were supported by the National Science Foundation. The field party included representatives of Argentina’s Museo de La Plata, Minot State University, the University of Oklahoma, the South Dakota Geological Survey and graduate students from University of California, Riverside and the South Dakota School of Mines & Technology.

According to Case, luck played a major role in the find. First, relatively few dinosaur fossils from the end of the Cretaceous Period, which lasted from 144 million to 65 million years ago, (the second half of the so-called “Age of Dinosaurs”), have been found in Antarctica.

Second, the specimen was an exceedingly rare find and one of only six dinosaur fossils that have been discovered in the James Ross region of the Antarctic Peninsula, the landmass that juts north from the southernmost continent towards South America. Also, to have been preserved at all, the animal likely floated from the shore out to sea after it died roughly 70 million years ago and settled to the bottom of what was then a very shallow area of the Weddell Sea.

The team concentrated its investigations on the Naze, a northerly projecting peninsula, where exposed materials represent a period at the end of the Mesozoic Era, a span of time between 248 million to 65 million years ago that in-



CREDIT: WILLIAM HAMMER, NATIONAL SCIENCE FOUNDATION

*NSF-funded researcher William Hammer, of Augustana College, works on a find near the Beardmore Glacier.*

cludes the Cretaceous Period. At that time, the area was covered by the waters of the continental shelf, roughly 100 to 200 meters (300 to 650 feet) deep.

If confirmed, as Case and Martin expect, the new species is only the second Antarctic theropod from the late Cretaceous Period.

## *Journey To The Top Of A Mountain*

At the same time, thousands of miles away, a research team led by William Hammer of Augustana College in Rock Island, Ill., was working in the Antarctic interior on a mountaintop roughly 3,900 meters (13,000 feet) high and near the Beardmore Glacier.

They found embedded in solid rock what they believe to be the pelvis of a primitive sauropod, a four-legged, plant-eating dinosaur similar to better-known creatures such as brachiosaurus and diplodocus.

Now known as Mt. Kirkpatrick, the area was once a soft riverbed before millions of years of tectonic activity beardslevated it skyward. Also a veteran dino hunter known for his discovery of *Cryolophosaurus ellioti* in 1991, Hammer had returned to the site of that find to continue his work, which had been halted in part because the *Cryolophosaurus* excavation had dug far into a cliff face, creating a potentially dangerous overhang.

Specialized workers were flown into the research camp at Beardmore Glacier to remove the overhang and make it safer to continue the excavations.

As Hammer and his team waited, Peter



*The pelvis of what researchers believe is a previously unknown plant-eating dinosaur exposed on the rock where it was preserved.*

CREDIT: WILLIAM HAMMER, NATIONAL SCIENCE FOUNDATION

Braddock, a mountain safety guide on Hammer's team, scoured the area, informally looking for fossils.

"I jokingly said to him, 'Keep your eyes down, look for weird things in the rock,'" Hammer said. "He had marked four or five things he thought were odd, including some fossilized roots. But I realized that one of these things was bone: part of a huge pelvis and ilium and much, much bigger than the corresponding bones in *Cryolophosaurus*."

Based on field analysis of the bones, Hammer and his fellow researchers believe the pelvis—roughly one meter (three feet) across—is from a primitive sauropod that represents one of the earliest forms of the emerging dinosaur lineage that eventually produced animals more than 30 meters (100 feet) long.

Basing his estimates on the bones excavated at the site, Hammer suggests the new, and as-yet-unnamed, creature was between 1.8 and 2.1



*A group of Scott tents pitched in the shadow of the Transantarctic Mountains.*



*Research team at work on James Ross Island, near the Antarctica Peninsula, where the bones of scientists believe is a previously unknown carnivorous dinosaur were found.*

CREDIT: NATIONAL SCIENCE FOUNDATION

meters (six and seven feet) tall and up to nine meters (30 feet) long. Hammer said that the rocks in which the find was made helped to establish that the creature lived roughly 200 million years ago, millions of years before the creature Case and Martin discovered on the Antarctic Peninsula.

Hammer said several lines of evidence point to the conclusion that his and the discovery by Case and Martin represent two new species yielded up by the rocks of the "Harsh Continent."

"This site is so far removed geographically from any site near its age, it's clearly a new dinosaur to Antarctica," Hammer said. "We have so few dinosaur specimens from the whole continent, compared to any other place, that almost anything we find down there is new to science," Hammer said. □

## Columbus Connections Lucky For Antarctic Fossil Hunter

**Columbus Dispatch, 17 Feb. 2004, by Mary Mogan Edwards**—On future Antarctic expeditions, William Hammer would do well to make sure that someone—anyone—from central Ohio comes along. The Hammer team's latest big dinosaur find, unearthed in December, is the second one to be spotted first by someone from Columbus. On that most-recent trip, it was Peter Braddock who spotted a bit of fossilized bone that turned out to be significant. Braddock, a New Zealander who lives in Columbus, is an accomplished mountaineer who taught outdoor education in his native country and has accompanied and assisted scientists on their Antarctic missions for 22 years. He is married to an Ohio State University geologist.

On the 1991 expedition that brought Hammer the distinction of having identified a previously unknown dinosaur species, it was OSU geology professor David Elliot—on the Frozen Continent to conduct his own, unrelated research—who stumbled across the bones.

Elliot's and Hammer's teams were among eight groups working on separate projects in the Transantarctic Mountains that year, sharing a base

camp and fleet of helicopters needed to ferry the scientists to and from work sites. When Elliot's forays among the rocks led him to a giant protruding bone, he had only to get on the radio to let Hammer know he had found something.

*"It was entirely serendipity," Elliot said of finding the fossilized skeleton of a 22-foot-long ancestor of *Tyrannosaurus rex*, which Hammer graciously dubbed *Cryolophosaurus ellioti*.*

"With a vertebrate paleontologist actually there, it was only right for me to turn it over to him," Elliot said. Thirteen years later, as Hammer's team scoured the same area, Braddock's find came about 100 feet from Elliot's.

That the mountain guide would strike fossil gold is no shock to Elliot, who also has used Braddock's services on Antarctic trips. "He's not a scientist by training, but he has worked with scientists so many times, he has an eye for things." Elliot's work centers on what led to the breakup of Pangea, the original single landmass that began dividing into the separate continents 180 million years ago.

Geologists thrive in the cold of Antarctica, Elliot said, because the rocks there are devoid of water and vegetation that, in warmer climes, hide and degrade the rocks and fossils. His own efforts there have yielded successes, including evidence that the Pangea breakup sparked spectacular volcanic eruptions below the Earth's surface that spread laterally through the crust, as far as 4,000 kilometers.

Finding the most complete dinosaur skeleton yet unearthed in Antarctica "is simply gravy," he said. "It's not the core of what I do."

Still, "It's sort of neat," Elliot allowed. "For any geologist to have a fossil named after him is a source of pleasure." □

# Antarctic Notes

edited by Jeff Rubin

## Keep Hotels Off Ice, Say Officials

**New Zealand Herald, 14 April 2004, by Simon Collins**—New Zealand is urging other countries to ban hotels in Antarctica. Trevor Hughes, head of the Antarctic policy unit in the Ministry of Foreign Affairs and Trade, told the NZ Antarctic Conference yesterday that any tourists based in hotels would threaten the Antarctic Treaty system. Hughes said the issue was discussed at a recent conference in Norway, and New Zealand planned to raise it again at this year's Antarctic Treaty meeting in Cape Town next month. The Norwegian conference agreed on one practical step—refusing to give permits for visitors to Antarctica unless their insurance policies covered the potential cost of search and rescue and medical evacuation. But New Zealand wanted to go further and ban land-based tourism. □

## Fungi Cause of Wood Decay in Historic Antarctic Huts

**American Society for Microbiology, 19 March 2004**—Soft rot fungi appears to be the cause of some decay in historic wooden huts in Antarctic, say researchers from the U.S. and New Zealand. Three huts—the Discovery hut, the Cape Royds hut and the Cape Evans hut—have begun to exhibit wood degradation over the past several decades. Several species of *Cadophora* fungi were identified in two of the three samples and researchers determined the cause to be moisture in the ground from extreme melting and thawing during certain seasons. "The presence of *Cadophora* species, but only limited decay, suggests there is no immediate threat to structural integrity of the huts," they said. "These fungi, however, are widely found in wood from the historic huts and have the capacity to cause extensive soft rot if conditions that are more conducive to decay become common." Their results appear in the March 2004 issue of *Applied and Environmental Microbiology*. □

## Penguins Forage Together for Protection

**BBC News Online, 24 March 2004, by Paul Rincon**—By attaching miniature cameras to the backs of five chinstrap penguins and five Adelle penguins, researchers from the British Antarctic Survey found that the penguins swim closely with at least one other bird on about 24% of foraging dives, in which they target krill. The researchers propose that because the cameras only look forward, it suggests the animals may swim in a group for about half of their foraging dives. They think the co-ordinated behavior may be a strategy to avoid predators rather than to corral krill. Details appear in the Royal Society journal *Biology Letters*. □

## Japanese Fleet Kills 440 Minke

**Agence France Press, 30 March 2004**—Japan's research whaling fleet killed a self-imposed quota of 440 minke whales in Antarctic waters, officials said. Japan kills about 700 large whales a year in the name of research, including animals taken on a summer whaling voyage to the North Pacific which is doubly controversial as endangered sei whales have been part of the quota. The meat—about 2000 tonnes annually, according to environmental groups—is sold to finance future whaling missions. According to the whaling commission's rules, research whalemeat must be processed and sold, a fishery ministry official said. □

## Rare 'Tumbleweed' Survives Antarctic Conditions

**NSF, ARLINGTON, Va., 3 March 2004**—A balloon-shaped robot explorer that one day could search for water on other planets has survived some of the most trying conditions on Earth during a 70km wind-driven trek across Antarctica. The Tumbleweed Rover, being developed at NASA's Jet Propulsion Laboratory, left South Pole station on 24 Jan., completing its roll roughly 8 days later. Along the way, the beach-ball-shaped device, 2m in diameter, used the global Iridium satellite network to send information about its position, air temperature, pressure, humidity and light intensity to a ground station. The ultra-durable ball reached speeds of 30 km/h, with an average speed of 6 km/h, much faster than conventional mechanical rovers—such as Spirit and Opportunity, currently operating on the surface of Mars—which average little more than 0.05 km/h on flat, dry ground. □

## Scientists Revive Life Forms Millions of Years Old

**www.stuff.co.nz, 20 February 2004**—Scientists have revived primitive life forms retrieved from frozen ground in the Antarctic and believed to be up to eight million years old, a significant step in helping develop new methods for investigating whether alien life has existed, or still exists, on other planets, University of Otago geologist Dr. Gary Wilson said this week. Wilson has helped lead a 24-member team on the nine-year project. With Imre Friedmann from NASA and David Gilchinsky from the Russian Academy of Sciences, Wilson extracted dormant bacteria from sedimentary layers at several sites beneath frozen ground estimated to be between five and eight million years old, while ensuring the bacteria was not contaminated by other organisms. To revive the bacteria, collected from soil with a temperature of about -27deg C, they placed samples in dishes and raised the temperature to varying levels. At temperatures above 0deg C, the bacteria began to revive and grow. □

## Solo Yachtsman Rescued from Southern Ocean

**Agence France Press, SYDNEY, 14 February 2004**—A badly injured Japanese yachtsman was rescued by a British cargo ship after his yacht rolled in the Southern Ocean. Solo yachtsman Masayoshi Kikuchi, 66, abandoned his round-the-world bid after both of his arms were broken, leaving him helpless and unable to steer his yacht. □

## Scientists Tackle Antarctic Pollutant Riddle

**Australian Associated Press, 7 January 2004**—Atmospheric chemist Douglas Davis and colleagues from the Georgia Institute of Technology in Atlanta are trying to discover why one of the most unpolluted places on Earth produces an increasing amount of natural pollution in the form of nitrous oxide and nitrogen dioxide, chemicals found in vehicle pollution and in lightning. Davis' research has shown that nitrate ions in Antarctica's snow absorb ultraviolet rays and produce the atmospheric pollutants. The ozone hole above Antarctica means more UV rays are reaching the surface. However, Davis said it was too early to tell the long-term effects of increasing pollution on Antarctica, or on the rest of the planet. □

## Scientists Say Antarctic Bacteria Can Help Treat Cancer

**Press Trust of India, NEW DELHI, 26 December 2003**—Three species of bacteria brought back from Antarctica by an Indian expedition contain high amounts of a cancer-preventing substance and could form the basis for launching a new industry, scientists claim. The "anabaena," "nostoc" and "phormidium" species belong to a class of organisms called cyanobacteria, better known as blue-green algae. The three Antarctic strains were collected from a glacial melt water stream near the Indian station Maitri. Botanists who analyzed them claim these organisms produced twice as much carotenoid as strains of same species found in mainland India. □

tists claim. The "anabaena," "nostoc" and "phormidium" species belong to a class of organisms called cyanobacteria, better known as blue-green algae. The three Antarctic strains were collected from a glacial melt water stream near the Indian station Maitri. Botanists who analyzed them claim these organisms produced twice as much carotenoid as strains of same species found in mainland India. □

## U.K. Adventurers Rescued From Antarctic

**Associated Press, LONDON, 20 December 2003**—Rescuers picked up two injured British adventurers Saturday after their helicopter crashed in the Antarctic. Jennifer Murray and Colin Bodill, who are attempting to circumnavigate the Earth across both poles, were found "safe and well," Britain's Foreign Office said. Murray, 63, had a broken arm, and Bodill, 53, received unspecified injuries, expedition organizer Polar First said in a statement. They were to be taken to Chile for treatment. The two set off from New York on Oct. 22, hoping to complete the 31,000 mile circumpolar voyage in April. They reached the South Pole on Dec. 17. □ (cb Billy-Ace Baker)

## Meteorite That Killed 90 Percent of Species May Have Hit Tropics

**New York Times online, SAN FRANCISCO, 16 December 2003, by Kenneth Chang**—Scientists who support a controversial theory that a meteor crash coincided with the largest mass extinction in earth's history now assert that they have narrowed the location of the impact—somewhere on land in the tropics. The extinction occurred 250 million years ago at the boundary between the Permian and Triassic geological periods, and killed 90% of the living species. Most scientists theorize that the most likely cause was a series of giant volcanic eruptions in Siberia that spewed 600,000 cubic miles of lava and might have induced catastrophic ecological changes. Last month, scientists headed by Dr. Asish R. Basu, at the University of Rochester, reported in the journal *Science* that they had found shards of the meteorite in rocks from Antarctica. Other researchers agreed that the fragments looked extraterrestrial, but questioned whether they were as old as claimed. On Friday, at a meeting of the American Geophysical Union here, the same group of scientists reported finding tiny glass spheres about one-thousandth of an inch in diameter in the same layer of rock in Antarctica. The spheres, the scientists said, are pieces of the earth's crust melted by the meteor impact and then cooled into spheres. □ (cb Billy-Ace Baker)

## Australia to Deploy Armed Ship to Protect Fisheries

**Reuters, CANBERRA, 17 December 2003**—Australia has dramatically stepped up measures to protect fish stocks in its remote southern seas from poachers by ordering a vessel armed with a deck-mounted .50 caliber machine gun. Australia's customs service is leasing an ice-strengthened ship for permanent patrols around the country's islands near Antarctica. The tough approach comes after Australian authorities spent 21 days in August chasing a Uruguayan-flagged boat suspected of poaching the highly prized Patagonian toothfish through treacherous Antarctic seas. □ (cb Billy-Ace Baker)

## India Considers Another Antarctic Station

**Press Trust of India, NEW DELHI, 12 December 2003**—India is planning to set up another permanent station in Antarctica. Science and Technology Minister Murlu Manohar Joshi said, "In addition to Maitri, an exploratory survey is proposed to be undertaken during the forthcoming XXIII Indian Ant-

arctic Expedition, to locate a suitable site for setting up another scientific station at Antarctica." □

### Stranded Pilot to Leave Antarctica

**The (Melbourne) Age, 13 December 2003**—Stranded Australian pilot Jon Johanson is planning to fly out of Antarctica on Saturday, providing the weather holds up. Johanson, who was attempting to fly to Argentina from Invercargill, had been forced to land at McMurdo on Monday after flying to the South Pole without enough fuel to return to New Zealand or fly on. Mr Johanson had 35 hours of fuel for a journey estimated to take 36 hours by going through the South Pole rather than the most direct route to Argentina, which would have required 33 hours. He had no search-and-rescue back-up or contingency plans. British pilot Polly Vacher cancelled her trans-Antarctic charity flight and threw a lifeline to Mr Johanson, by offering him fuel that she had previously sent to Scott Base via a private cruise ship. □ **(cb Billy-Ace Baker)**

### Three Entrants for Inaugural Antarctica Cup Yacht Race

**New Zealand Press Association, 10 December 2003**—Britain will have a team in the inaugural Antarctica Cup yacht race, joining New Zealand and Australian entrants already confirmed. The 14,600-nautical mile, non-stop, nation-versus-nation Antarctica Cup is set to start on 12 Feb. 2005 in Auckland, and last 45 days. The fleet of identical 25m maxis, each carrying 14 crew, will head south and east to round Cape Horn and on to the Cape of Good Hope. It will pass north of Kerguelen to the southwest of Australia, before heading back to New Zealand. □

### Cold and dark affecting Antarctic workers' memory

**New Zealand Herald, 29 September 2003, by Simon Collins**—People working in Antarctica's cold, dark winter are losing their short-term memory. The disorder, named 'polar T3 syndrome' after a thyroid hormone called triiodothyronine (T3), is being investigated by doctors at McMurdo and the South Pole. Twenty volunteers at each base will take part in an experiment next winter in which they will sit beside a light box for 30 minutes each morning to see whether exposure to light can counter the effects of the Antarctic's five months of total darkness from April to August. Previous research has found that a daily thyroxin pill reduces other symptoms of the disorder, such as tiredness and depression. McMurdo's senior physician, Dr. Jotham Lefford, said the syndrome also raised people's blood pressure and cholesterol. □

## RGS Archive Comes in from the Cold

**The Times (of London), 19 November 2003, by Sam Coates**—Tucked away at the end of Exhibition Road, in the grand Victorian museums of London, up from the Natural History Museum, the Science Museum and the V&A, is a nondescript black door, barely noticed by the crowds.

Inside the Grade II listed building is an inspirational collection of two million maps, photographs, artefacts, books and manuscripts, which tell the story of a thousand years of exploration and endeavour.

The archive belongs to the Royal Geographical Society (RGS), founded in 1830 for the advancement of geographical science. Today it is one of the most active learned societies in the world. The archive includes the 15th-century Mercator maps and gives a glimpse into the triumphs, obstacles and disasters of adventurers such as Scott of the Antarctic.

Yet this priceless collection, which would rival any other on Exhibition Road, is rarely seen by the public. The archive, much of which has been kept for decades in boxes in unsuitable conditions, is in danger of disintegrating and is only catalogued on card. Today *The Times* begins its Christmas appeal to open up the RGS collection to the public, who will be able to look at it in person and over the Internet for the first time.

The plan, called "Unlocking the Archives," involves building a new public centre adjoining the RGS headquarters on Exhibition Road. This glass "pavilion" is due to open in April next year and will include an education centre, exhibition space, display centre and reading room.

The centre will give the public access to more than a hundred tonnes of material, held in climate-controlled conditions in the new and refurbished basement stores.

The public, including schools, will be able to see what is available after 250,000 digitised record cards have been loaded on to the electronic library system, which will be accessible over the internet.

One of the projects that *The Times* is raising money for is to save the collection's polar archive—50,000 artefacts relating to Arctic and Antarctic exploration—for future generations.

Readers' money will pay for the 20,000 polar prints, albums, maps, negatives and lantern slides to be put on the society's website, including the photographic record of Captain Scott's fateful expedition between 1910 and 1913.

It will also allow the society to store polar artefacts in an environmentally controlled secure space. This will house sledges, scientific equipment, polar medals and expedition provisions, such as the Burberry helmet worn by Ernest Shackleton on his Antarctic journey in 1908-09.

Money raised will also pay for research services in the reading room, giving access to the 12,000 books and periodicals on the poles, including original copies of the *South Polar Times*, written by Scott's men on their first Antarctic mission in 1902-03.

Dr Rita Gardner, the director of the RGS, said: "Unlocking the archives is a great project, which is bringing half a million of our oldest items to the public. It is opening the society intellectually, physically and visually to the wider public through this great resource."

Among the items in the RGS collection:

**Books:** 12,000 items, half of which are books and pamphlets, the other half periodical articles, including the *South Polar Times*, produced in 1902-03 during Robert Scott's Discovery expedition to the Antarctic.

**Pictures:** 20,000 drawings, watercolours, oil paintings, loose photographic prints, albums, negatives and lantern slides from 76 expeditions, including 800 contact prints from Scott's fatal expedition in 1910-13.

**Maps:** More than 1,500 maps and charts from both poles, including the Svalbard atlas and 23 maps by Claudius Ptolemy, the astronomer, mathematician and geographer from Alexandria, rediscovered in the 15th century.

**Manuscripts:** Some 40 to 45 boxes of manuscripts and letters, including a Bible presented to Ernest Shackleton by Queen Alexandria in 1914.

**Artefacts:** From expeditions by Scott, Shackleton, and Sir Ranulph Fiennes, including the Burberry helmet worn by Shackleton on his 1908-09 journey and sledge skis and cooking equipment used by Fiennes and Dr Michael Stroud in their 1993 expedition. □

## Antarctica: Soon the Only Habitable Continent?

**New Zealand Herald, 4 May 2004, by Geoffrey Lean**—Antarctica is likely to be the world's only habitable continent by the end of this century if global warming remains unchecked, the British government's chief scientist, Professor Sir David King, said last week.

He said that the Earth was entering the "first hot period" since 60 million years ago, when there was no ice on the planet and "the rest of the globe could not sustain human life."

The shock warning—one of the starkest yet delivered by a top scientist or senior government figure—comes as British ministers are deciding whether to weaken measures next week to cut

the pollution that causes climate change.

"That is despite Tony Blair last week describing the situation as 'very, very critical indeed.'"

The Prime Minister—who was launching a new alliance of governments, businesses and pressure groups to tackle global warming—added that he could not think of "any bigger long-term question facing the world community." Yet the Government is considering relaxing limits on emissions by industry under an EU scheme on Tuesday.

Sir David says that there is "plenty of evidence" to back up his warning. Levels of carbon dioxide in the atmosphere—the main "green-

house gas" causing climate change—were already 50 percent higher than at any time in the last 420,000 years. The last time they were at this level—379 parts per million and rising—was 60 million years ago during a rapid period of global warming in the Palaeocene epoch, he said. Levels soared to 1,000 parts per million, causing a massive reduction of life on earth.

"No ice was left on earth. Antarctica was the best place for mammals to live, and the rest of the world would not sustain human life," he said.

Sir David warned that if the world did not curb its burning of fossil fuels "we will reach that level by the end of the century." □

# South Pole Station Construction Proceeding Apace

by Jeff Rubin

The excitement in Jerry Marty's voice comes through loud and clear as he discusses the progress made on the new elevated Amundsen-Scott South Pole Station.

This past summer construction season "was one of the more successful to date," says Marty, construction project manager. "We continued to maintain the overall master schedule...which allows us to clearly see that the Jan. 2007 date for a station dedication will be achievable."

Conditional occupancy of the A3 wing of the elevated station was achieved this summer. This wing includes the medical facility, computer lab workstations, greenhouse, store and post office, laundry room, various storage and mechanical rooms and a quiet/reading room.

This season also saw the continued transition of facilities out of the Dome and into the new station, with the relocation of the medical facility. The new medical facility, which opened for business on Jan. 28, 2004, is state of the art. All of the medical equipment is new, Marty says, "with exception of the dental chair."

Another major goal achieved was completion of the exterior framing and panel enclosure of wings B1 and B3, "which allowed us to maintain our winterover construction schedule," Marty says.

During the winter, when it's too cold even for the stalwarts building the new station to work outdoors, the construction workers will work inside the newly-enclosed wings.

After suffering poor weather last season, which frequently caused flight cancellations, Marty says, "we exceeded our construction schedule expectations because of good weather, and we were able to bring in some additional flights, to begin steel framing of wings A4 (summer housing) and B4 (multipurpose, recreation and public meeting rooms), the elevated station's last two wings."

"What this means is that we can get a jumpstart on completion of the steel and panel enclosure of those two wings" next summer, Marty says. "We had a very good season with weather, which enabled us to get the added flights that we needed."

Marty also credits the crews building the new station. "Many of the workers have been with us for five seasons," he says. "They've all learned little tricks here and there that make it more efficient and more safe—so our efficiency was extremely high."

Although their contracts give workers escalating bonuses for repeated years of work, Marty says that something more than that is what brings them back to the very difficult working conditions at 90 South: "It's probably safe to say that the reason they keep coming back is their pride in being part of the team that's doing something very special, that's part of history. They're ex-



*New South Pole Station, viewed from the front (above) and side, continues to expand across the Antarctic landscape.*

cited that they're part of it. In addition, they're working with a lot of folks that they've worked with in the past, so there's a comradery."

Seventy-five people will overwinter at the Pole this year, including eight scientists, 22 station support personnel and 46 construction workers.

Some will live in the Dome, in what will probably be the second-to-last group to winter there.

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The "Bring the Dome Home" movement is not dead.

In fact, during the next southern summer, a staff member of the U.S. Navy Seabee Museum at the Port Hueneme Naval Base near Oxnard, Calif., accompanied by a representative of Temcor, the company that manufactured the Dome, will visit the South Pole on a reconnaissance mission.

The goal: examine the feasibility of returning the Dome to the U.S., either in whole or in part.

"I think it's going to happen," exults Marty, who makes no effort to hide his happiness. "To what degree—that's a decision that the Seabee museum will have to tell us. But some portion of that Dome, I believe, will find itself at the Seabee museum. I've always hoped that will happen. There are many of us who hope we can live out our dream of going through that museum in our wheelchairs, showing our grandchildren where we used to work." □

## NEWS FLASH

### Station Expands to 154 Beds

Science at the South Pole got a welcome boost earlier this year when Congress voted to add \$9 million to the budget for building the new elevated station. The station will now be able to support an additional 44 people, for a total capacity of 154 people. When the station was designed, infrastructure was planned to accommodate up to 150 people, should the science being conducted at the South Pole justify the need for more accommodation there. Now Congress says that need has been demonstrated. The additional funding also pays for extra costs incurred by weather delays to the construction schedule.

Jerry Marty, construction project manager, says Congress' decision shows that cutting-edge South Pole science substantiates the need for 44 extra beds at the station: "The proposed science projects have received such positive reviews—that's why we're here. We are supporting something that's unique on planet Earth." □

PHOTOS BY JERRY MARTY

## Centerfold Mystery Solved?

In our Fall-Winter 2003 issue, our centerfold was an unmarked U.S. Navy photo of a site presumably in Antarctica (maybe not), and we asked readers if any recognized the location. Here are the responses received, and you'll note that nobody's ready to bet the farm on their conclusion. I will add that if anyone has need of a first-rate detective, they should give Jerry Huffman a call!—**Cliff Bekkedahl, Editor, *The Polar Times***

■ I would presume by now that someone has positively identified the photo you were asking about in the Vol. 3, No. 4 issue of *The Polar Times*. On the off-chance that has not happened, I would like to add my own guess—it's been a while, and I was only there once, but it looks like the acclimatization camp at Fang Ridge on Mt. Erebus. It was used to permit people to adjust to the elevation change from McMurdo prior to their being ferried to the top of Erebus.

Perhaps someone else who has been there more often than I will confirm, or perhaps someone who has actually been where it really is will refute my guess.—**Greg Nelson**

■ That centerfold appears to be Mount Aribes near Hut Point. It would have to be after 1956. In 1956, Mount Aribes was smoking when I was there. I have a collection of 35mm slides from Deep Freeze I; none are as good as that one in the centerfold. I hope this is some help.—**Al Vogt**

■ First, it is obvious that it's not Marilyn Monroe. Second, I am not sure, but if it hasn't been identified, I can throw out something for your research. About 1962, the Arctic Institute of North America conducted a program, Icefield Ranges Research Project in the St. Elias Mts. The

station was named Divide, as it was between the Kaskawulsh Glacier and the Hubbard Glacier. After the building got drifted over, someone painted "FAYLOR'S FOLLY" on the roof top, for Bob Faylor, the then-director of the Arctic Institute of North America. Third, if my wild assumption turns out to be valid, who do I get for my prize? Cheers!—**Paul Dalrymple**

■ Although I don't recognize the subject site, there are objects in the picture that would help date it and thus narrow the check of field camps that year that fit with the objects shown. I was the USARP rep at McMurdo much of the time from 1966-1979 during the austral summers, as well as serving as the NSF staff engineer full-time, year-round, until my disability retirement in 1980. Knowing some details about field parties indicates the following:

In the center of the picture is a Caterpillar crawler bucket which means this camp was either located by C-130 at some remote site or else it is close enough to McMurdo that equipment could drive to the site. The flatness of the foreground surface combined with the ridging in the background could mean that the camp is on sea ice very close to the shore. When sea ice moves, it frequently ridges at the interface with the shoreline. During the late 1970s, I worked with naval engineers to secure small radioactive power generators (RPGs) which were going to be used to power remote weather stations in the Antarctic. The shorter masts on the right of the picture look like weather instruments and the taller one a transmitter tower. The fact of many guy wires would indicate the tower is meant to withstand the harsh winter(s). The blue building is unlike any that I was familiar with, thus dating it to 1979-1980 austral summer or later. The small fold-down triangular opening

near the back side of the building would indicate it is a specialized design. On the left side of the picture is a freshly delivered aluminum pallet with a tie-down strap still intact across the box. The large cylinder on that pallet could be an RPG, and the yellow decal at the top could be the standard warning notice of radioactivity present. During the development of these weather stations by scientists, some were battery-operated at start-up to test the functions prior to the repowering by RPG when reliability was established. The battery-powered stations usually did not operate reliably through the winter.

My guess—only a guess—is that this is a weather station site within driving distance of Williams Field, and the RPG has been delivered by crawler, not by C-130, to be installed, replacing battery power. The station is at least one winter old, and the tracks in the foreground suggest that there has been a lot of crawler activity, unlike at the usual field camp.

I have many photos from my Antarctic service, and most USN photos have the name of the photographer on the back. The name on the back of this photo would date the photographer's service year(s). Summer personnel serving in Deep Freeze served three-year assignments. That would narrow the search considerably, although a look at the weather station locations probably will identify this site immediately. I'm sure very accurate records of the RPG locations are kept for obvious reasons. If that is an RPG on the pallet, that will further confirm the site location. Somehow that mountain in the background looks like one I saw from McMurdo many times over the years. If I can help further, drop me a line. Best wishes—**Jerry W. Huffman, Retired Old Antarctic Explorer, (i.e. retoae)** □



# L'Antarctique à la française

by Kate Cambor

For the past year, I've been working at Yale University on a group biography about three young people in *fin-de-siècle* France and the world in which they lived. One of the protagonists of this story is Jean-Baptiste Charcot, whose childhood in one of the most illustrious households in Paris as the son of the world-famous neurologist Jean-Martin Charcot, in addition to his later exploits as France's premier Antarctic explorer, makes him a fascinating subject for any historian.

While conducting research in France for this project, I learned about a French cruise being organized to commemorate the 100th anniversary of Charcot's first trip to the Antarctic Peninsula. Figuring that this would be an excellent opportunity to learn more about Charcot and to get a first-hand sense for what he experienced during his expedition, I immediately signed up. It was only several months later, as I was preparing for my first trip to Antarctica, that I began to realize what I had undertaken.

For most English-speaking Antarctic enthusiasts, the exploits of Shackleton and Scott epitomize the world of Antarctic adventure. For French speakers, the name synonymous with Antarctic exploration is Jean-Baptiste Charcot (1867-1936). On his first expedition in 1903-5, on the *Français*, Charcot and his crew charted and sketched almost 620 miles of coasts and islands on the west coast of the Antarctic Peninsula. A total of 1,250 miles of coastline and newly discovered territory was surveyed during his second expedition on the *Pourquoi-Pas?* from 1908 to 1910. Maps created from this expedition were so precise that they were still being used 25 years later by sealers and whalers, and the scientific data Charcot and his men compiled fill 28 volumes.

To celebrate the 100th anniversary of Charcot's first trip to the Antarctic, the Paris-based tour company GNL organized a 12-day cruise for Francophones in January 2004. Following Charcot's itinerary for his 1903-04 expedition, we traveled from Paulet Island to Petermann Island to Deception Island, immers-

ing ourselves in Charcot's historical exploits and the present-day beauty of the Antarctic landscape.

Many of the trip's participants met for the first time in September 2003 at the Charcot family home in Neuilly, outside Paris. There, I learned I would be the only American and non-native French speaker and, at 28, the youngest participant.

Madame Anne-Marie Vallin, Charcot's granddaughter, welcomed the 20 or so curious would-be explorers with grace and goodwill. On a tour of the well-appointed home, we encountered intricate wood-work created by Jean-Martin Charcot and some of Jean-Baptiste's favorite childhood toys, as well as unusual memorabilia from his exploring days, like a small, carved black cat that he took on all of his voyages save the final one in which he perished. We ended the afternoon with a Champagne toast in honor of the great name Charcot and our upcoming trip.

Four months later, I found myself walking towards the hulking *Grigory Mikheev* in the port of Ushuaia, Argentina, with 30 or so fellow travelers. My excitement was tinged with apprehension: This was my first trip to Antarctica and my first experience on the open sea. Moreover, I'd have to rely on my less-than-fluent French to navigate these foreign waters.

*For French speakers, the name synonymous with Antarctic exploration is Jean-Baptiste Charcot (1867-1936).*

Having stowed away my gear and introduced myself to my cabin-mate—a friendly young woman in her 30s named Elise—I trooped up to the top deck to watch as we left behind the orange-and-brown-hued city of Ushuaia for the open sea.

As someone who suffers from motion sickness in anything that moves, the rolling waves of the Drake Passage had me clutching my stomach and taking refuge in my bunk during the first few days. (At least, I comforted myself, Charcot himself confessed in his diary that he too suffered from *mal de mer*.)

Everyone was relieved when, on the fourth day, our Russian crew whisked us ashore by Zodiac at Paulet Island, where we were overwhelmed by the sight and smell of thousands of Adélie penguins. Later that afternoon, we stopped at Base Esperanza in Hope Bay. We eagerly followed our Argentine guides through their tour of the compound. Some of us tried out our Spanish with the children who had just arrived for the summer,



PHOTO BY KATE CAMBOR

*Charcot built a cairn and placed inside it a bottle filled with documents explaining his work and his itinerary, in case he and the expedition perished during their time in Antarctica.*

while others queued at the make-shift post office.

We spent the following days becoming accustomed to the incredible vistas and to the sights and sounds of seals and whales while, at night, our two lecturers, Marie Foucard and Serge Kahn, led us through the history of Antarctic exploration and Charcot's personal odyssey to map and explore the region.

Meals were the best chance to get acquainted with the other passengers. For the French, after all, a meal is a social event to be relished and enjoyed. Over *patés*, *duck à l'orange* and plenty of wine, I met men and women who'd been to the polar regions many times and others who, like me, had never seen an iceberg. Many had grown up reading stories about Charcot and leapt at the chance to take one of the few Francophone cruises to Antarctica. As "*la petite américaine*" (the little American), I was something of a curiosity to this gang of mostly older Frenchmen and women, and I often found myself having to explain why I had come on a French-speaking cruise to commemorate Charcot.

Perhaps the highlight of the trip was our visit to Port Charcot on the north coast of Booth Island. Charcot had stayed in this semi-protected bay in the winter of 1904 and had named the spot after his father. It is also one of the rare places in the Peninsula region where Adélie, gentoo and chinstrap penguins nest contiguously; Charcot, in his diary, wrote of how excited he was to be able to spend an entire winter studying these animals. To stave off winter boredom, Charcot's men read and discussed old

(CONTINUED AT RIGHT)



PHOTO BY KATE CAMBOR

*Madame Anne-Marie Vallin, Charcot's granddaughter, speaks to reporters about her famous grandfather.*

newspaper stories and gave each other lectures on various topics. Later in the winter Charcot organized an "Antarctic picnic" on a nearby island to amuse the men, although, he admitted, the meat and butter were so frozen that they had to be broken up with axes.

After disembarking from the Zodiacs, our entire group trudged quietly to the top of a ridge overlooking the water. There Charcot had built a cairn and placed inside it a bottle filled with documents explaining his work and his itinerary, in case he and the expedition perished during their time in Antarctica. Charcot's granddaughter made her way slowly to the top, followed by a French TV crew. After spending some time at the cairn, we gradually made our way down to the vestiges of a stone hut that had been used to store scientific material and food, as well as to the stone remnants of a meteorological shelter. After returning to the ship, the passengers and the captain were treated to Champagne by Mme. Vallin, in honor of our visit to the spot that bears her family name.

The next day we saw more gentoo penguins at Port Circoncision on Petermann Island, where Charcot's expedition wintered in 1909. To keep the men's spirits up during the long, dark winter, Charcot and his assistants offered courses in grammar, geography, English and navigation. Atop a hill overlooking the busy colony of penguins is a cairn built by Charcot. We left Petermann Island and returned to our ship, where, at 11 a.m., we had a spontaneous party with the crews of three French yachts in the area. More Champagne toasts followed, as everyone raised glasses to Charcot's first winter in Antarctica—and to our own good fortune to follow in his wake.

Then we were off to the British base at Port Lockroy on Wiencke Island, where my French companions tried out their English, and I spoke American. Charcot discovered Port Lockroy in February 1904 and named it in honor of the French minister of the marine, Edouard Lockroy. A year later, Charcot was forced to spend ten days there repairing the *Français's* boiler.

At Paradise Bay, we surveyed the tall, icy ridges surrounding the harbor with awe and some sadness: our trip was coming to a close, and none of us felt ready to leave behind this beautiful spot at the end of the world.

We spent our final day at eerie Deception Island, where grim remnants of a whaling station remain. Charcot had stopped at the station first in 1908, when he had saved a man's life by amputating his gangrenous hand. A year later Charcot returned to resupply with coal and make some repairs to the *Pourquoi-Pas?* Our modern expedition faced no such adversity, although a few brave souls bathed in the hot, sulfurous waters, while the rest of us looked on from beneath our many layers of Gore-tex.

As we headed back toward Argentina, we braced ourselves not only for the rough waters of the Drake Passage, but for our return to our "real lives" far away from icebergs and penguins. I returned to New York with a backpack full of film, the addresses of a dozen new French friends and the determination to head back to Antarctica as soon as I can—on another French-speaking cruise, *à la française*. □

## BOOK REVIEWS

### *Antarctica: An Encyclopedia From Abbott Ice Shelf To Zooplankton*

Edited by Mary Trewby. (Firefly Books, 2002, 208 pp, Canadian\$35)

### *Encyclopedia Of Antarctica and The Southern Oceans*

Edited by Bernard Stonehouse. (Wiley, 2002, 391 pp, \$350)

One can have too many coffee-table books on Antarctica, but I recommend just one or two more to appeal to the Antartophile.

The price for Mary Trewby's book is right, and so is the content. The objective is an effort to provide readers with brief descriptions of many of the terms that appear in the literature related to Antarctica, and it does the job very well. It was produced by the award-winning documentary company Natural History New Zealand, with the input of 18 consulting editors, all from New Zealand and experts in their fields. The roughly 1,000 alphabetical entries are broken up by lengthier descriptions of sections on the Antarctic Treaty, Dry Valleys, Exploration, Icebergs, Penguins and the South Pole. High-quality photographs, most in color, can be found on nearly every page.

There are a number of minor "gremlins," a trait that few books can eliminate totally. To give just two examples: The northern giant petrel has a reddish color to the bill tip, while the southern has a greenish tip, although the book states the reverse; and the Political map shows France's Port Martin base about 60° of longitude west of its true location.

Nevertheless, the book has considerable value in assembling virtually all the words and terms that are found in the literature and when visiting research stations (the entry on 'Vocabulary' is particularly enlightening). Descriptions of expeditions are brief, but useful in describing what happened and when. This book will be of interest to anyone with a collection of polar books, and it makes a handsome addition to a coffee table. The cover photos demand that anyone looking at it will pick it up, and it is a required purchase for libraries.

The encyclopedia by renowned polar specialist in biology, Dr. Bernard Stonehouse, Scott Polar Research Institute, Cambridge, U.K., is probably the most complete and true encyclopedia of any on the market, past or present. Stonehouse has enlisted 28 contributors, nearly all from the U.K., and six advisory editors, all experts in their fields. Stonehouse's encyclopedia is pricier than Trewby's, but it has distinct advantages.

Stonehouse's book has about 300 more entries, and no color photos, though it includes a color map of the Antarctic Peninsula and a large foldout color map of the entire continent. The smaller photos and numerous maps yield space for additional text, which includes six appendices on Antarctic Treaty documents and eight Study Guides (Climate and Life; Exploration; Geography; Geology and Glaciology; Information Sources; National Interests in Antarctica; Protected Areas Under the Antarctic Treaty; and Southern Oceans and Islands).

If there was a choice of one versus the other, and if price was no object, I would choose Stonehouse's. For a little extra money, though, you can have both. Each has its place on the bookshelf of individuals who often need to refer to a book of this nature to look up a name, date, or place. Libraries will certainly want both. A second edition of either book in paperback would be advantageous as a means of reducing the price, and would also allow correction of the errors found in each book.

□ *Reviews by John Spletstoesser, APS President*

### *The South Pole: An Account of the Norwegian Antarctic Expedition in the "Fram," 1910-1912*

by Roald Amundsen. Foreword by Fridtjof Nansen. New introduction by Roland Huntford. Translated from the Norwegian by A.G. Chater. NY, Cooper Square Press, 2001. Vol. I, 392 p. Vol. II, 449 p., incl. 7 Appendixes, Index, b&w illus. Paperback \$29.95U.S.

This Cooper Square Press paperback edition is an unabridged re-publication of the edition first published in two volumes in New York in 1913, here combined into one volume and supplemented with a new introduction by Roland Huntford.

This account by the great explorer himself is a truly impressive story, starting with preparations for the expedition that was publicized as one to the North Pole and, after leaving Norway, changed objectives to achieve the South Pole. The organized nature and detail of the man is shown in numerous ways, from the selection of participants (the best skiers in Norway), procurement and training of sledge dogs, food for both men and dogs, space and weight allowances of field gear and consideration for his companions with regard to morale and emphasizing the successful policy of keeping them busy so as to avoid complaints and boredom. Although the parallel expedition led by Robert Falcon Scott in the same time period, 1910-1912, is not discussed, it would appear that it did not affect Amundsen's timetable or overall conduct of his successful achievement of the South Pole on 14 December 1911. Amundsen had a somewhat shorter distance from his base "Framheim" at the Ross Ice Shelf barrier to the Pole than did Scott on

(CONTINUED ON PAGE 30)

Ross Island, but he also had an unknown route to explore to get to the Pole. The segment from the Ice Shelf to the Plateau is a case in point, traveling through extensive crevasse fields of the Axel Heiberg Glacier and other areas, occasionally dropping both dogs and men through bridged crevasses. Planning was everything, knowing when to kill the proper number of dogs in order to reduce weight, consume less food and have slain dogs provide food for both working dogs and men.

The details are relatively simple. On October 20, 1911, together with four companions (Olav Bjaaland, Helmer Hanssen, Sverre Hassel, and Oscar Wisting) and 52 dogs, he left "Framheim" for the Pole, returning 99 days later, on 25 January 1912, with two sledges and 11 dogs. Total distance traveled was 1,860 miles. (It is interesting to me that nearly everyone who has read accounts on the achievement of the South Pole knows the names of Scott, Wilson, and Bowers, who died in the final camp on the Ross Ice Shelf, as well as Evans and Oates earlier, but not many can recall the names of Amundsen's four companions.)

When the vicinity of the Pole was reached, at the first Polar station, on Dec. 15, 1911, 18 altitudes of the Sun were taken in all, with each of the expedition's two sextants, resulting in an average latitude of 89° 54' S, with a mean error of  $\pm 2'$ . The ultimate camp, "Polheim," was about as close to the Pole as was possible, based on travel around it and with further measurements. If it is assumed that the position of "Polheim" is correct, the group passed the Pole itself at a distance of between 400 and 600 meters, and it is possible that they passed the actual Pole at a distance of a few hundred meters, perhaps even less (Appendix IV, p. 402-403). This was never contested by Scott, who reached the Pole on 17 January 1912, only to find Amundsen's tent at "Polheim."

A considerable part of Volume I is about dogs, how they worked hauling sledges, became favorites of the drivers and were ultimately killed as a means of precise planning. The "Butcher's Shop," where 10 dogs were killed and eaten by surviving dogs and the men, is spoken of unpleasantly, but was necessary in light of the objective of the expedition.

Chapter XV is an account of the separate exploration of Edward VII Land (now Edward VII Peninsula) by K. Prestrud, and Chapter XVI, by Thorvald Nilsen, is about the voyage of the "Fram" for the entire itinerary of the vessel, from Norway at the start to Hobart at the end.

Appendix I is about "Fram" and details of its construction; II, Meteorological observations at "Framheim"; III, Geology (samples from Mt. Betty and Edward VII Land); IV, Astronomical observations at the Pole; V, Oceanography from "Fram" in the North Atlantic in 1910 and South Atlantic in 1911.

The value of this book is in Amundsen's telling the story in his own words and, although somewhat like a diary or journal in content, it is interesting reading. Considerable detail is included about the men's moods, how they pulled their weight during the polar journey

and their interaction with the dogs, the very element of their success and survival. The book belongs in personal polar libraries, as well as in libraries in general for the worth of reading how a successful expedition is conducted. The book *Anatomy of an Expedition* (1969), by H. William Menard comes to mind in the case of an oceanographic expedition, but the title could well apply to Amundsen's book. **Reviewed by John Splettstoesser, APS President**

## *Exploring Polar Frontiers: a Historical Encyclopedia*

By William James Mills. (ABC-CLIO, 2003, 2 vols., 797 pp, \$185)

This encyclopedia is a surprising work. Rather than being merely a quick reference—which it certainly is, also—this is an encyclopedia to browse, to enjoy, to savor. For instead of a myriad of brief entries, this is a wonderful collection of well-written essays. One can look forward to many long evenings sitting at the fireside happily reading this work from cover to cover (and cover to cover again, for it is in two volumes) because it is filled with finely-wrought stories. A well-developed sense of narrative pervades *Exploring Polar Frontiers*, leaving you with the impression that you have the rare privilege of being the private audience of a gifted and knowledgeable polar raconteur.

In fact, that is exactly the case. Mr. Mills, who was the keeper of collections and librarian at the Scott Polar Research Institute at England's University of Cambridge until he died on 8 May 2004, used his unparalleled knowledge of the world's finest polar library to mine SPRI's collection of original manuscripts and published sources, many of them rare and out of print.

Mr. Mills wrote in the introduction about his habit of working late at night and into the early hours of the morning, a practice personally familiar to this reviewer as well. Perhaps those midnight hours clarified his thinking and writing, for it has a clean, unadorned quality that makes it powerful.

The 511 entries range from Luigi Duke of Abruzzi to Zavadovski Island, and chronologically from the voyage of Pythias in ca. 325 BC to Børge Ousland's first solo crossing of the Arctic Ocean in 2001. Nearly all of the entries span at least a full page; some are as long as eight pages. At the end of each is a list of related topics as well as references and further reading.

Reading these volumes reminds us that there are many more fascinating tales in polar exploration than just Shackleton's Endurance expedition and the race between Peary and Cook for the North Pole.

Three separate tables of contents (alphabetical, chronological and by category) make it easy both to search systematically and to make connections between entries, for as the author notes: "Expeditions indeed can never be understood in isolation."

The 20 full-page maps are well-drawn and easy to read, and the many black-and-white illustrations are judiciously chosen. The 27-page bibliography is extensive and helpful.

This two-volume work also has a benefit for those of us who are not yet completely "bi-polar"—the entries are not divided by Arctic and Antarctic, but instead are interleaved according to alphabetical order, thus opening new horizons to many readers who may know north or south exclusively.

An intriguing note for libraries and scholars: the encyclopedia is available as an E-book, which allows for quick searches and cross-references through the use of hypertext.

With this encyclopedia, Mr. Mills has given us a gift, sharing his extensive knowledge and obvious love of the polar regions in a way that will continue to reward us for years to come.

**Reviewed by Jeff Rubin, Antarctic Editor, The Polar Times**

## *1421: The Year China Discovered America*

by Calvin Menzies. New York: William Morrow, 2002. 552 p. With five Appendices, endnotes and index. Includes illustrations and maps.

As one can see from the title, this is an amazing book. It presents evidence that the Chinese, led by the Eunuch captains Hong Bao, Zhou Man, Zhou Wen and Yang Qing, sailed giant teak junks literally around the world while our European ancestors were still in the late Middle Ages. Emperor Zhu Di, the third Ming emperor, was the impetus for all of these voyages of discovery.

For our interest, they discovered Antarctica, sailed north of Greenland and navigated the Northeast Passage across the top of Russia long before even the most adventurous Mariners even sailed out of the sight of land.

The author, Gavin Menzies, was born in China in 1937 and in 1953 joined the Royal Navy. From 1959 to 1970, he served in submarines, and sailed the world in the wakes of Columbus, Diaz, Cabral and Vasco da Gama. While in command of HMS Rorqual, he sailed the routes pioneered by Magellan and Captain Cook. Since leaving the Royal Navy, he has returned to China and the Far East many times and in the course of researching this book, visited some 900 libraries and museums in more than 120 countries, including every major seaport of the late Middle Ages.

Based on his research, Gavin Menzies contends that most of the major European voyages had Chinese predecessors and Chinese originated maps to guide them! This turns out to be the case for Columbus, Magellan's circumnavigation of the world, Captain James Cook's 'discovery' of Australia, Bartolomeu Dias' 'discovery' of the Cape of Good Hope, Vasco da Gama and his 'discoveries' and most of the other great voyages by the Europeans.

The Chinese also established colonies in Sacramento, Los Angeles, Bahia California, Guatemala, Venezuela, Ecuador, Peru, Easter Island, Pitcairn Island, Tahiti, Samoa, the Caroline

Islands, New South Wales and Gympie in Australia, the Waikato River in New Zealand, Micronesia, the Hawaiian Islands and Norfolk Island, just in the Pacific alone. They introduced the Asian chicken to many areas of South America and Ming era porcelain was found world wide as was Chinese silk. Stone and cave carvings indicating that fair or yellow skinned people who dressed strangely – in dresses and long pants as opposed to furs and loincloths – and women with hair worn in buns as opposed to braided indicate that the Chinese lost ships en-route and the survivors set up colonies where they intermarried with the native populations. DNA evidence is quoted

that confirms the Chinese presence in many native cultures of the world. In addition, finished precious stones such as Chinese emeralds and Chinese jade have been found world wide as evidence of the Chinese presence.

The Chinese tried to determine exactly where they were on the globe – and they already had a good idea as to the size of the globe – and even navigated using the North Star in the Northern Hemisphere and the Southern Cross when in the Southern Hemisphere. The Chinese may even have sailed to the North Pole. According to the great expert on Ming China, J. Needham, in his book *Science and Civilisation in China*, states that there

are more than twenty separate Chinese claims that they actually reached the North Pole.

After visiting Iceland in 1477, Christopher Columbus wrote in his own hand in Pope Pius II's book, *History of Remarkable Things that Happened in my Time*, "Men have come hither [to Iceland] from Cathay in the Orient." This indicates that Chinese ships were in the vicinity of Iceland.

If one is to believe the author's claims—and he presents a very good case for his claims—the history of exploration will have to be changed very radically. ☐ **Reviewed by Peter J. Anderson**

## Frozen History: The Legacy of Scott and Shackleton

by Josef & Katharina Hoflehner (Josef Hoflehner Photography, 2003, 288 pp, \$88)

Antarctica has found its own Walker Evans, or, more accurately, two of them.

The American photographer (1903-75), famous for his black-and-white photographs of the American South, used carefully composed views to celebrate everyday objects and landscapes that, as the authoritative Dictionary of Art puts it, "seemed to distill the essence of time and place."

Josef and Katharina Hoflehner, a father and daughter team from the town of Wels in Austria, have done the same for the earliest buildings on the White Continent.

The photographers fell in love with the historic huts of the Ross Sea region as soon as they first saw them in January 2001. In Mr. Hoflehner's words, they immediately became "addicted to the idea of this book"—of trying to capture the unique ambiance inside the century-old wooden houses at Hut Point, Cape Evans and Cape Adare left behind by British explorers Robert F. Scott and Ernest H. Shackleton.

the Ross Sea in the summer of 2001-02. "It was a very special experience in itself," Mr. Hoflehner writes, "to camp within a short distance from the huts in the midst of this breathtaking landscape."

The Hoflehners' was a formidable challenge. The huts are uncomfortably cold. And they are dimly lit, for the soot-blackened walls and ceilings absorb much of the little amount of light that filters through the small windows. Because they wished to use only natural light—no flash equipment or artificial illumination—the Hoflehners employed a heavy tripod and long exposure times.

"We did our best," Mr. Hoflehner modestly writes, "to produce photographs as pristine as possible that capture the atmosphere and mood within these magic places."

This is a stunning book; the photographs, haunting.

Although we reproduce here (with Mr. Hoflehner's permission) a few of the 180 photographs in *Frozen History*, these reproductions are but a poor facsimile of those in the book, where they are printed in a warm, rich duo-tone so tactile that they seem almost to be photogravures printed on fine watercolor paper. In fact, the book's pages are "a modern woodfree coated paper," evidently a successful medium for these extraordinary photographs.

The delicate etchings of rust on a saw blade, the fraying fibers of a coiled hemp cord, the shining surface of oozing seal blubber 'planks,' the reindeer-skin sleeping bags shedding tiny white hairs—all are captured in unbelievable clarity and focus.

These are the huts and their contents as they have never been seen before, for they have never been photographed like this before.



A rack of grubby shirtsleeves is so real that you can feel the cotton beneath your fingers without even touching the page. Leftover reams of paper in Shackleton's "Nimrod" Hut, destined for production of *Aurora Australis* but never used, lie stacked on a shelf—and your thumb knows exactly how it would feel, were you able, to riffle the exposed edges of the thick sheets.

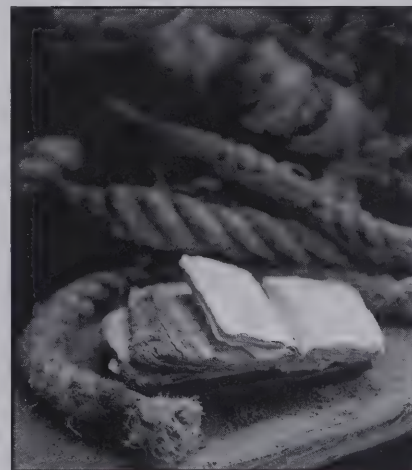
The effect is so arresting that Margie Thomson, reviewing *Frozen History* in the *New Zealand Herald* (7 March 2004), vividly called

(CONTINUED ON PAGE 32)



Thanks to a fellowship with New Zealand's Artists & Writers Programme, which provided logistical support, the Hoflehners returned to

**Editor's Note:** All "Frozen History" photographs on pages 31 and 32 were taken by authors Josef and Katharina Hoflehner, a father and daughter team from the town of Wels in Austria.






the photographs "so textural they catch at our eyes like splinters in fingers."

No wonder the book, printed and bound in Italy by Stamperia Valdona, has found a market in museum shops, specialized photography bookstores and art galleries.

Wise, indeed, will be the first curator who follows her instinct and schedules an exhibition of these photographs.

With accompanying text (in English) by New Zealand polar historian David L. Harrowfield, the book also includes excerpts from the diaries of the men who lived here, however briefly.

Voted "Austria's most beautiful book" in 2003, *Frozen History* follows an earlier work by the Hoflehners, *Southern Ocean: Photographs of a Journey* (157 pages; 2002), which includes color and black-and-white photographs of a voyage to Campbell Island, Macquarie Island, the Auckland Islands and the Ross Sea region. The same discerning eye informs this book, taking landscapes and icescapes that we thought we knew and showing them to us again as if for the first time.

For more information, please visit [www.frozenhistory.com](http://www.frozenhistory.com).  **Reviewed by Jeff Rubin, Antarctic Editor**



## TOP 10 ANTARCTIC FILM PICKS

*Seattle Post-Intelligencer*, PARADISE HARBOR, ANTARCTICA, 29 January 2004, by William Arnold—One hundred years ago—in late January 1904—an unknown member of the Scottish National Antarctic Expedition removed the lens cover from a bulky, wood-encased camera and hand-cranked the first motion-picture footage of the Antarctic continent.

During the next century, all the great South Polar expeditions would chronicle their feats on celluloid, and the movies and Antarctica would develop a relationship that film historian Kevin Brownlow calls “unique in the annals of both art and exploration.”

Indeed, virtually all the great moments of the “Heroic Age” of Antarctic exploration—Scott’s dash toward doom in 1911, the icy implosion of Shackleton’s ship *Endurance* in 1915, Byrd’s ecstatic face as he becomes the first man to fly over the South Pole in 1929—are preserved on film.

With a short stack of DVDs, you can witness the entire course of Antarctic exploration in the past century—the equivalent of having a documentary cycle on the Winning of the West, from Lewis and Clark to the gun-down of Butch and Sundance. □

**For anyone planning an odyssey to Antarctica or simply in the market for an Antarctic Film Festival in the comfort of their own home, the following are 10 must-sees:**

- **South (1919):** The 1998 British Film Institute restoration and Milestone Video release of this compilation of Frank Hurley’s haunting footage from the 1914 *Endurance* expedition was the catalyst that kicked off the great Shackleton renaissance of the late 1990s.

- **With Byrd at the South Pole (1930):** After a stilted sound introduction, this mostly silent, Oscar-winning (for best cinematography) account of Admiral Byrd’s 1928-29 first flight over the South Pole settles in to be one of the most enthralling of all polar documentaries.

- **90° South: With Scott to the Antarctic (1933):** Herbert Ponting’s footage of Robert Scott’s ill-fated “*Terra Nova*” expedition was released as nickelodeon episodes in 1912, then as the 1924 feature, “*The Great White Silence*,” and finally as this sound feature narrated by Ponting himself.

- **Scott of the Antarctic (1948):** The great British cameraman Geoffrey Unsworth (“2001: A Space Odyssey”) was one of the cinematographers of this lavishly produced Scott biopic, and Ralph Vaughan Williams later expanded the score into his famous “*Sinfonia Antarctica*.”

- **The Secret Land (1948):** This well-mounted, MGM Technicolor chronicle of the U.S. Navy’s 1946-47 “*Operation High Jump*”—which was co-narrated by Robert Taylor and won the 1948 documentary Oscar—is sadly not available on video, but periodically shows up on Turner Classic Movies.

- **Cry of the Penguins (1971):** This bizarre British comedy starring John Hurt as a swinging London biologist who moves into Shackleton’s old hut on Antarctica’s Cape Royds contains the movies’ most spectacular—and heartbreaking—footage of life and death in a penguin rookery.

- **Antarctica (1984):** Vangelis contributed the score for this poorly dubbed but splendidly photographed Japanese drama that tells the true story of a team of sled dogs inadvertently left to overwinter by themselves at Japan’s East Antarctica station in 1957.

- **Imax Antarctica (1991):** The Lonely Planet Guide claims this Imax featurette gets poor marks by many “Antarctic connoisseurs” for its content, but on the big, big Imax screen it came thrillingly close to capturing the continent’s scope and beauty.

- **Richard Byrd: Alone in Antarctica (1997):** Footage from Byrd’s 1934 winter alone in a hut on the Ross Ice Shelf (where he nearly died of carbon monoxide poisoning) makes up this one-hour episode of the five-part PBS series “*The Adventurers*,” available on PBS video.

- **Imax Endurance / Endurance: Shackleton’s Legendary Antarctic Adventure (2000):** Two excellent accounts of the *Endurance* adventure—the first a 40-minute Imax featurette narrated by Kevin Spacey, the second a more comprehensive 35 mm feature documentary narrated by Liam Neeson. □

## OBITUARIES

### Virginia Fiennes

*Associated Press*, LONDON, 21 February 2004—Virginia Fiennes, wife of explorer Sir Ranulph Fiennes and instigator of one of his greatest adventures, died Friday. She was 56. No cause of death was given.

She married army officer and adventurer Ranulph Fiennes in 1970.

She is credited with giving her husband the idea of voyaging by land and sea around the world and across both poles.

The couple and a small team set off on the 35,000-mile journey from London in 1979. They finished three years later, having survived everything from a polar bear attack to desert sunburn.

As the mission’s main organizer, Virginia traveled much of the way with her husband and ran bases at the North and South poles.

In 1987, she was awarded the Polar Medal by Queen Elizabeth II, the first woman to receive the honor.

The couple lived on a farm in southwest England, where Virginia bred Aberdeen Angus cattle and Black Welsh Mountain sheep. □

### Duncan Carse

*Telegraph.co.uk*, 7 May 2004—Duncan Carse, who made his mark both as a polar explorer and as a professional radio broadcaster and actor, died on May 2. He was 90.

In four southern summers, between 1951 and 1957, Carse organized and led the South Georgia Survey. It produced the first proper map of the island, published in 1958 and still the standard. During the 1982 conflict on South Georgia, it was an essential aid to operations.

Carse was the youngest member of the British Graham Land Expedition of 1934-37, and he had turned his attention to South Georgia after his proposal to cross the Antarctic continent had been turned down in favour of Sir Vivian Fuchs’ Trans-Antarctic Expedition, 1955-58.

Carse paid two further visits to South Georgia, and was lucky to come back alive. In 1961 “as a personal psychological experiment,” he lived alone from February to September (the southern winter) at a small harbor on the island’s windward west coast. In May his hut was destroyed and many of his stores were swept away by a surge wave. He managed to survive until rescued by the whale catcher *Petrel* and later made a TV documentary of his experience.

In December 1973, Carse was landed from the survey ship *Endurance* at King Haakon Bay, on South Georgia’s west coast. His aim was to retrace Shackleton’s famous march across the island, but he was defeated by a severe blizzard.

Carse was honored in the naming of Carse Point on the Antarctic Peninsula, and of Mt. Carse in the southern part of South Georgia.

He is survived by his third wife, Venetia; two daughters; and a son. □ (cb Billy-Ace Baker)

(CONTINUED ON PAGE 34)

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## William Mills

William James Mills, keeper of collections and librarian at the Scott Polar Research Institute, a position he held since 1989, died at home on 8 May 2004. He was 52 years old.

Mills authored the 2003 work *Exploring Polar Frontiers: a Historical Encyclopedia* (reviewed in this issue on p. 31).

He is survived by his wife Tze-yun (known as "Dione") and three children, Jacqueline, Anthony and John. □

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## Lloyd E. Newcomer

Commander Lloyd E. Newcomer, USN (Ret) died on 18 Dec 2003. He was 85.

Cdr Newcomer made two deployments to Antarctica (Deep Freeze '60 and '61). Newcomer Glacier in the Sentinel Range was named for him.

On April 9, 1961, he landed in Antarctica in winter on a successful mission to rescue an ailing Russian scientist at Byrd Station. The mission was the first flight to the continent during the austral winter and at the time was the longest rescue mission in history: nearly 13,000 miles from Quonset Point, Rhode Island, to McMurdo-Byrd Station in Antarctica.

"When he flew that mission to Antarctica, he said he navigated by the stars, like the penguins," said his daughter, Bonnie. "Those were his last words," she said. "Like the penguins."

Survivors include his wife and six daughters.—*by Billy-Ace Penguin Baker* □

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## Ruth J. Siple

Ruth J. Siple, longtime honorary president of the Antarctic Society and beloved wife of polar explorer and scientist Paul A. Siple, died on 23 Jan 2004. She was 92.

After her husband's death in 1968, she worked in the library of the National Geographic Society for seven years and then at the Arctic Institute of North America (Arlington) for several years.

Although she had been involved with the Antarctic Society from its inception in 1959, she became more active in 1976 and subsequently served the Society with great dedication. She was president in 1977-78, honorary president from 1988 until her death and assisted Dr. Paul C. Dalrymple with the production of its newsletter for 25 years.

Mrs. Siple had three memorable experiences in her later years. In 1975, she went to Antarctica for five days, one day being spent at the South Pole for the dedication of the U.S. Amundsen-Scott South Pole Station (she later returned to Antarctica on a three-week tourist cruise). In 1993, she went to Wellington, New Zealand, for the re-dedication of the restored Byrd Memorial on Mt. Victoria. In 1997, she had the honor of christening the new Antarctic research ship *Laurence M. Gould* in Louisiana.

She is survived by one brother and three daughters.—*by the Siple family* □

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## Verne Peckham

Verne Peckham, research scientist and educator who did the first extensive diving as well as the first scientific diving under the ice in Antarctica, died on March 19, 2004, the day before his 67th birthday.

After a term in the Coast Guard and earning a degree in marine biology from UC Santa Barbara, Verne spent the 1961-62 year at McMurdo, where he dived in Winter Quarters Bay and off Cape Armitage and Cape Evans. Using a dry suit, he dove to depths of 160 feet (see "Year-round SCUBA diving in the Antarctic" *Polar Record* 12: 143-46). For a brief history of early diving in Antarctica, see <http://repositories.cdlib.org/sio/techreport/22/>

Peckham Glacier in the Britannia Range was named in recognition of his early contributions to Antarctic biology.

He is survived by a daughter, Rima Peckham Olvera; and her mother Sandra Tyrrell; a son, William Hawk Peckham; and William's mother, Cindy Swan.

Donations may be made to the Witukomnom Farm School Land Trust, c/o P.O. Box 1070, Covelo, CA 95428.—*by Cindy Swan and John Pearce* □

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## Morton Rubin

Morton Joseph Rubin, a former National Oceanic and Atmospheric Administration meteorologist who was a scientific officer for the World Meteorological Organization in Geneva from the early 1970s to 1982, died 10 April 2004. He was 86.

Mr. Rubin began his career in 1938 as a weather observer for the U.S. Weather Bureau in Pennsylvania and spent the 1940s in Peru and Chile as a supervisory meteorologist for Pan American-Grace Airways.

During the mid- and late 1950s, he made several trips to Antarctica; he was also a U.S. exchange scientist at Russia's Mirny Station.

In the early 1960s, the Australian government named Mount Rubin in Antarctica's Prince Charles Mountains in his honor.

Survivors include his second wife, Rosa Dockett Rubin; three children; a brother; and two stepchildren.

"The 15 months that I was on The Ice with the Russians was a very rewarding and almost heart-warming experience—I got along very well with the Russians. Many of them had never met an American," he said in an interview with Brian Shoemaker in 2000 for the American Po-

lar Society's Oral History Program.—*with material from the Washington Post, 13 April 2004* □

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## Mort Turner

Mortimer D. Turner, longtime program manager for Earth Sciences at the National Science Foundation's Office of Polar Programs (OPP) and recipient of the American Polar Society's Honorary Service Award in 2003, died on 1 May 2004. He was 83.

Dr Turner became a project officer at the OPP at its genesis as the International Geophysical Year ended in 1959. He served the office in many capacities between then and 1985 when he left the program. He made 27 trips to the Antarctic.

Turner Hills in Antarctica, the mineral Turnerite, a fossil plesiosaur and a prehistoric fossil sea mammal are all named after him.

Survivors include his wife, the former JoAnne Church, of Boulder; two daughters; a son; and a stepson.

Dr. Turner was interviewed by Brian Shoemaker for the American Polar Society's Oral History Project in 1997. (*with material from the Boulder Daily Camera, 4 May 2004*). □

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## Max Britton

*Washington Post*, by Patricia Sullivan—Max Britton, 92, one of the first environmental scientists to specialize in the study of the Arctic, died March 16 at his home in Arlington of complications from emphysema.

Dr. Britton helped initiate the idea of establishing research stations on ice floes, including one that floated across the top of the world in a four-year journey from the Point Barrow region off Alaska to the seas between Greenland and Iceland.

As the chief scientific officer at the Naval Arctic Research Laboratory from 1955 to 1971, Dr. Britton coordinated baseline scientific research into such areas as animal habits, plant study, ocean currents and the behavior of the polar ice.

Born in the southwestern Indiana town of Hymara, Dr. Britton received a bachelor's degree from Indiana State Teachers College and a doctorate from Northwestern University, where he became a professor of botany. He served as an Army lab technician during World War II.

A geographic landmark at Barrow was named Britton Manor in his honor.

His second wife, Vera Kamila Britton, died in May after 46 years of marriage. □

**R**esponding to member suggestions, *The Polar Times* will, in each Winter issue, list the names of members who have passed in the previous twelve months. Please assist us by notifying one of the editors of any member you know of who passed in this time period. This will not be a substitute for our normal practice of publishing obituaries received. □

## Secretary's Letter

**H**i, fellow APS members. The key point of this summer's message is a call for volunteers to relieve the members of the present staff that have yet to be replaced. We have a new membership chair that I believe you are being introduced to elsewhere in this issue of *The Polar Times*. The Treasurer and myself, the Secretary of the APS, are also looking for replacements.

Any member interested in participating more actively in the APS is encouraged to put his or her name into consideration. Just send an email with your interest and some information on your background to [Sto396@yahoo.com](mailto:Sto396@yahoo.com),

I'll see that you are contacted. Include a telephone number where you can be reached, and I will contact you ASAP. The jobs are rewarding, interesting and vital to a smooth running Society.

Looking forward to hearing from you. □

*Frank Stokes*

*Secretary American Polar Society*

**AMERICAN  
POLAR  
SOCIETY**  
Membership is  
a great gift!

### Purpose of APS

*"The purpose of the American Polar Society is to bring together people interested in research and exploration in the Arctic and Arctic; to preserve the record of polar research and exploration; and to support and encourage research and exploration in polar and polar-like regions. Toward these ends, the Society will collect and disseminate information about polar regions; compile written records, oral histories, maps, photographs, film and video, and electronic information relating to polar regions; aid organizers and members of polar expeditions; and maintain contact with scientists, explorers, research institutions and interested parties."* □

## Membership Letter

**G**reetings from the coast of Maine! My name is Charles Lagerbom, and I am the new APS membership chairman.

I take over from outgoing chair Bob Kremenak and would like to recognize him for having done an excellent job with this position these past years. He has been great in helping me get up to speed, and we hope to provide an uninterrupted and smooth transition.

My first task is to get the members' addresses ready for this year's next issue of *The Polar Times*. So if you have had any changes, please contact me. Second task is a quick reminder to any of you who have yet to pay your '04 (or earlier) dues. Thank you for getting them in.

Also as new Chair, I would like the society to focus on recruiting and retaining new members and would like to hear from you with any ideas, thoughts or comments regarding this. If each current member brought in just one new member this year, the results would be dramatic!

My goals for this position are to be efficient, proactive and accessible. I look forward to serving as your membership chairman and can be reached by email at [ampolars@prexar.com](mailto:ampolars@prexar.com) or by regular mail at American Polar Society Membership Center, P.O. Box 300, Searsport, ME 04974. □

*Charles Lagerbom*

### About Your Annual APS Dues

*The Board of Governors has set the dues structure for the year 2000 and after as follows:*

Annual Dues: Rate \$15 (Outside U.S. \$17)  
Library Dues: Rate \$20 (Outside U.S. \$22)  
Annual Corporate: Rate \$100  
Life Membership: \$250 (Outside U.S. \$270)

Each member's dues include a subscription to *The Polar Times*. The dues for each calendar year are payable, in advance, on receipt of a direct-mail statement, mailed each October from the Membership Center. Blue and white dues envelopes are no longer included in Fall-Winter issues of *The Polar Times*. If you have paid your dues ahead, for future years, you will not receive the annual statement until your dues are about to expire.

Address changes are entered in our membership file as we receive them, as are dues payments. Each member's entry includes the date of dues expiration. Mailing labels for *The Polar Times* are printed from this file, with the dues expiration date at the top of each label. You can see whether you are ahead or behind with your dues by looking at the mailing label. If you are a Life Member, that designation will appear at the top of the label instead of a dues expiration date.

We honor all dues paid in advance for future years, at the current rate, but upon expiration, new rates, if they have been adopted, will apply.

Multiple year dues payments are welcome and encouraged, as are donations to the Society. The American Polar Society is a tax exempt organization as defined by Sec 501 (C)3 of the IRS Code. □

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### Major Contributors In This Issue

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### ABOUT OUR BACK COVER

*This stove in Shackleton's hut at Cape Royds burned 500 lbs of coal a week to heat the hut, melt water and cook food. (It may even have cooked a curry like those Captain Scott's team enjoyed, for which we give the recipe on page 21.)—PHOTO BY JOSEF & KATHARINA HOFLEHNER, REPRINTED WITH PERMISSION FROM THEIR BOOK "FROZEN HISTORY: THE LEGACY OF SCOTT AND SHACKLETON," REVIEWED THIS ISSUE (WITH MORE PHOTOGRAPHS), PAGE 31. □*

